Bullard Energy Center
Application for Certification
Data Request Responses
06-AFC-8

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TECHNICAL AREA: AIR QUALITY

Data Request 1 Rev: Please provide copies of all substantive District correspondence regarding the BEC permit application, including e-mails, within one week of submittal or receipt. This request is in affect until the final Commission Decision has been recorded.

Response:

Effective on the date of this Data Request response, BEC will provide the CEC with copies of all substantive correspondence between the BEC and the SJVAPCD (Air District or District).

TECHNICAL AREA: AIR QUALITY

Data Request 2 Rev: Please provide a tabulated list showing quarterly emission and emission offset accounting indicating the proposed quantity used quarterly from each ERC source that will be used to fully offset the project's emissions.

Response:

See the table below showing emissions and offset requirements by quarter, as well as the ERC credits that have been secured as of the date of these data request responses. It is important to note that this table includes all the certificates that Energy Investors Funds (EIF) holds for both Bullard Energy Center and Panoche Energy Center. EIF plans to redistribute is SJVAPCD ERC holdings to match respective project requirements once the District has issued all the certificates EIF has purchased. Also note that SO2 ERCs are applied at a 1.87 to 1 inter-pollutant ratio for both BEC and PEC. Finally, this table shows that EIF has met all its ERC obligations for both projects except for 38.69 annual tons to for BEC PM10. EIF plans to purchase these remaining ERCs in a timely manner to support the District Final Determination of Compliance authorization and the BEC AFC Preliminary Staff Assessment

Energy Investors Funds - *EMISSION REDUCTION OFFSET REQUIREMENTS and HOLDINGS*

NOx

ERC Certificate No.	Name on Certificate		1Q, lbs	2Q, lbs.	3Q, lbs.	4Q, lbs.	Annual, lbs.	Annual, tons
S-2362-2	Panoche Energy Center, LLC	certificate value	44097	52114	52114	52114	200439	100.220
S-2363-2	Bullard Energy Center,LLC	certificate value	22343	26405	26405	26405	101558	50.779
S-2437-2	Panoche Energy Center, LLC	certificate value	22379	22627	22876	22876	90758	45.379
S-2217-2	LaPaloma	certificate value	9294	4654	14613	14.2805	28575	14.288
S-2439-2	Panoche Energy Center, LLC	certificate value	5123	5415	2148	3593	16279	8.140
S-2438-2	Panoche Energy Center, LLC	certificate value	0	9294	4654	14613	28561	14.2805
		total holdings	103236	120509	122810	119615	466170	233.085
		Panoche Requirements	64020	64020	93120	69840	291000	145.500
		surplus applied to Bullard	39216	56489	29690	49775	175170	87.59
		Bullard Requirement	32010	32010	46560	34920	145500	72.75
		overall surplus	7206	24479	-16870	14855	29670	14.835

VOC

ERC Certificate No.	Name on Certificate		1Q, lbs	2Q, lbs.	3Q, lbs.	4Q, lbs.	Annual, lbs.	Annual, tons
S-2333-1	Flying J/Big West	certificate value	34685	34685	34685	34685	138740	69.370
		total holdings	34685	34685	34685	34685	138740	69.37
		Panoche Requirements	20010	20010	29130	21840	90990	45.500
		surplus applied to Bullard	14675	14675	5555	12845	47750	23.87
		Bullard Requirements	10020	10020	14550	10920	45510	22.755
		overall surplus	4655	4655	-8995	1925	2240	1.115

PM10

ERC Certificate No.	Name on Certificate		1Q, lbs	2Q, lbs.	3Q, lbs.	4Q, lbs.	Annual, lbs.	Annual, tons
		SOx surplus applied to PM	49770	45550	58640	87356	230516	115.258
		SOx surplus adjusted to 1.87 ratio	26615	24358	31358	46714	123271	61.635
S-2431-4	Panoche Energy Center, LLC	certificate value	8741	7519	8213	8457	32930	16.465
S-2432-4	Panoche Energy Center, LLC	certificate value	904	923	981	961	3769	1.885
S-2433-4	Panoche Energy Center, LLC	certificate value	3587	3857	4416	4220	16080	8.040
S-2434-4	Panoche Energy Center, LLC	certificate value	3382	3622	3173	3855	14032	7.016
S-2435-4	Panoche Energy Center, LLC	certificate value	0	1079	1058	951	3088	1.544
S-2436-4	Panoche Energy Center, LLC	certificate value	0	686	802	723	2211	1.106
		total holdings	43229	42044	50001	65881	195381	97.690
		Panoche Requirements	40170	40170	58440	43830	182610	91.305
		surplus applied to Bullard	3059	1874	-8439	22051	12771	6.385
		Bullard Requirements	24600	24600	35780	26840	90150	45.075
		overall surplus	-21541	-22726	-44219	-4789	-77379	-38.690

SOx

ERC Certificate No.	Name on Certificate		1Q, lbs	2Q, lbs.	3Q, lbs.	4Q, lbs.	Annual, lbs.	Annual, tons
N-559-5	Panoche Energy Center, LLC	certificate value	1560	1560	1560	1560	6240	3.120
N-591-5	Panoche Energy Center, LLC	certificate value	53530	49310	0	91616	194456	97.228
N-597-5	Panoche Energy Center, LLC	certificate value			64800		54000	27.000
		total holdings	55090	50870	66360	93176	254696	127.348
		Panoche Requirements	3560	3560	5180	3900	16200	8.1
		surplus applied to Bullard	51530	47310	61180	89276	238496	119.248
		Bullard Requirements	1760	1760	2540	1920	7980	3.990
		overall surplus ((applied to PM10)	49770	45550	58640	87356	230516	115.258

TECHNICAL AREA: AIR QUALITY

Data Request 3 Rev: Please show in this tabulated list the current updated ERC certificate number and former certificate number for all certificates that have been recently split and/or re-issued in the name of the project.

Response:

The table presented in the response to Data Request 2 contains the requested information.

TECHNICAL AREA: AIR QUALITY

Data Request 4 Rev: Please also show in this list the location, method, and date of emission reduction for each of the ERCs.

Response:

The location and method of the emission reduction for each ERC is presented in the below table. Respective dates of each ERC were not provided by the District.

Cert. No.	Holder	Type	Reduction Source	Reduction Mechanism	Source Location
N-559-5	Panoche Energy Center	SO_x	J.R. Simplot Company	Modification to Sulfuric Acid Adsorption process	16777 S. Howland Rd Lathrop, CA
N-591-5	Panoche Energy Center	SO_x	J.R. Simplot Company	Modification to Sulfuric Acid Adsorption process	16777 S. Howland Rd Lathrop, CA
N-597-5	Panoche Energy Center	SO_x	Unilever	Fuel limit on Boiler	1785 N. Ashby Rd., Merced, CA
S-2431-4	Panoche Energy Center	PM_{10}	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 30/28S/21E
S-2432-4	Panoche Energy Center	PM_{10}	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 27/28S/21E
S-2433-4	Panoche Energy Center	PM_{10}	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 29/28S/21E
S-2434-4	Panoche Energy Center	PM_{10}	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 34/28S/21E
S-2435-4	Panoche Energy Center	PM_{10}	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 29/28S/21E
S-2436-4	Panoche Energy Center	PM_{10}	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 33/28S/21E
S-2333-1	Big West/Flying J	VOC	Big West/Flying J	Modify process to incinerate Coker exhaust in CO boiler	Rosedale Hwy. STR 28/29S/27E

Cert. No.	Holder	Type	Reduction Source	Reduction Mechanism	Source Location
S-2362-2	Panoche Energy Center, LLC	NO_x	Complete Energy (LaPaloma)	Retrofit of stationary reciprocating engines with pre-combustion chambers	Elk Hills
S-2363-2	Bullard Energy Center, LLC	NO_x	Complete Energy (LaPaloma)	Retrofit of stationary reciprocating engines with pre-combustion chambers	Elk Hills
S-2437-2	Panoche Energy Center, LLC	NO_x	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 02/28S/21E
S-2438-2	Panoche Energy Center, LLC	NO_x	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 34/28S/21E
S-2439-2	Panoche Energy Center, LLC	NO_x	Heavy Oil Western, Belridge Field	Convert steam generators from oil/NG to NG only	STR 34/28S/21E

Note: All ERC values in expressed in tons
All ERC values assume that 1.5 distance ration applies
NOx = oxides of nitrogen
PM10 = particulate matter less than 10 micrometers in diameter
SOx = oxides of sulfur
SJVAPCD = San Joaquin Valley Unified Air Pollution Control District
TBD = to be determined
VOC = volatile organic compound

* SOx used for PM10 inter-pollutant offset at 1.8 to 1 ratio
** This Certificate has not been secured

TECHNICAL AREA: AIR QUALITY

Data Request 5 Rev: Please provide an technical analysis that supports the proposed interpollutant offset ratio.

Response:

An analysis based on SJVAPCD air quality, atmospheric chemistry and emissions data to determine an appropriate SO2 to PM10 interpollutant offset ratio for new sources in Fresno County was prepared for the Panoche Energy Center. This analysis, which has been submitted to SJVAPCD as part of the Authority to Construct permit package for that project is equally applicable to the BEC project. The analysis, presented in Appendix A, Attachment 5-1, proposes an interpollutant ratio of 1.8 to 1. Subsequent communication from SJVAPCD indicates that the final required interpollutant ration will be 1.87 to 1. Although the Attachment also develops a proposed NOx to PM10 ratio, BEC is not proposing the use of NOx credits to offset Project PM10 emissions

TECHNICAL AREA: AIR QUALITY

Data Request 6 Rev: Please provide correspondence with the District indicating that they have accepted the proposed SOx for PM10 interpollutant offset trading ratio.

Response:

The SJVAPCD has indicated a willingness to accept SO2 credits to offset project PM10 emissions and is proceeding to process the Authority to Construct permit application on this basis. As of the date of submittal for these responses, the District has not yet confirmed that they have or have not accepted the proposed interpollutant ratio of 1.8 to 1 for the BEC project. However, in an e-mail dated January 16, 2007, Mr. Stanley Toms of the SJVAPD indicated that the approved ratio for the Panoche Energy Center project (also in Fresno County) will be 1.87 to 1 (See Appendix A, Attachment 6-1). It is likely that this same ratio will be selected for the BEC as well. Any further correspondence regarding the resolution of this issue for the BEC will be forwarded promptly to CEC, when available.

TECHNICAL AREA: AIR QUALITY

Data Request 7 Rev: Please explain why the NOx, CO, and VOC startup and shutdown emission levels indicated in Table 5.2-13 of the AFC are significantly different than the startup/shutdown estimates provided for the Walnut Creek Energy Park (05-AFC-2), Sun Valley Energy Project (05-AFC-3), and AES Highgrove Power Plant Project (06-AFC-2) that also will use the GE LMS100 turbines.

Response:

The turbine startup and shutdown data provided by General Electric and the breakdown of this information by Bibb Engineering to represent cold start emissions are included as a new sheet of Attachment 7-1 (provided in Appendix A), which is the revised Excel workbook for operational emissions calculations. Since the original data were developed for a fuel gas sulfur content of 0.5 grain per 100 dry standard cubic feet, the emissions information originally presented in AFC Table 5.2-13 has been adjusted to reflect a worst-case sulfur content of 0.75 grains per 100 cubic feet, as required by SJVAPCD (see tab labeled "BEC Turbines 100%" in Attachment 7-1). Otherwise, we have not received any information from General Electric that would suggest the startup and shutdown numbers presented in the AFC are not reasonably representative for LMS100 cold starts.

TECHNICAL AREA: AIR QUALITY

Data Request 8 Rev: Please provide the expected exhaust parameters (temperature and velocity) for the six specific initial commissioning tests identified on page 5.2-19 of the AFC.

Response:

Information provided by the turbine manufacturer (General Electric) on commissioning stack parameters and emissions for each LMS100 CTG is provided in the table below. The revised dispersion modeling conducted for the BEC commissioning emissions (see Response to Data Request 10) used a conservative combination of the stack parameters shown here. Note that the SO2 emissions have been adjusted to reflect a worst-case fuel gas sulfur content of 0.75 grains per 100 dry standard cubic feet. This is higher than the sulfur content assumed in the AFC and has been revised to conform with SJVAPCD permitting policies.

Operating and stack parameter for LMS100 Commissioning

Description	Power Level	Corrected Operating Hours	Estimated Fuel Rate (MMBtu/hr)	Total Estimated Emission per Event				Exhaust Temperature (deg F)	Exhaust Flow (ACFM)
				NO_X (lbs)	CO (lbs)	VOC (lbs)	PM_{10} (lbs)		
First fire the unit & then shutdown to check for leaks, etc									
	Core/Sync Idle	16	73.5	178	727	18.5	96	859	163836
Synch & Check E-stop									
	Sync Idle	12	73.5	133.5	545.2	13.9	72	859	163836
Additional AVR Commissioning									
	5%	12	92.8	251	363.2	8.7	72	864	226630
Break-in Run									
	5%	8	92.8	167.3	242.1	5.8	48	864	226630
Dynamic Commissioning of AVR & Commission Water									
Load Step 1	10.00%	4	166.1	66.8	277	21.0	24	868	289675
Load Step 2	20.00%	4	245.5	98.6	181	10.4	24	827	380155
Load Step 3	30.00%	4	319.3	128	181	10.6	24	806	456411
Load Step 4	40.00%	4	389.1	156	160	10.7	24	785	524273
Load Step 5	50.00%	4	457.4	184	132	11.3	24	770	588755
Load Step 6	60.00%	4	524.6	211	180	13.5	24	760	648646
Load Step 7	70.00%	4	590.8	237	247	16.3	24	752	706812
Load Step 8	80.00%	4	658.5	265	349	20.7	24	752	761888
Load Step 9	90.00%	4	727.9	292	516	29.5	24	758	817320
Load Step 10	100.00%	4	798.1	321	789	47.9	24	767	873543
Base load AVR Commissioning									
	100%	16	798.1	2689	4890	239.0	96	767	873543

TECHNICAL AREA: AIR QUALITY

Data Request 9 Rev: Please combine all of the receptor grids, the pollutant averaging periods, and annual meteorological files and then rerun the construction and operations modeling to create single run modeling files. Pollutants should also be combined for cases with similar exhaust parameter inputs. The combined modeling files should also address any other modeling issues identified in these data requests.

Response:

Revised dispersion model input/output files reflecting the changes to operational project emissions discussed in these data request responses are provided electronically on a CD accompanying these data request responses. All of these simulations have been conducted with the combined multiple-year meteorological input files and the combined receptor grids requested by CEC. The results of the revised modeling for BEC operations are presented below in Revised Table 5.2-18B. Construction modeling results are presented as the response to Data Request 19.

TABLE 5.2-18B
REVISED ISCST3 MODELING RESULTS FOR BEC OPERATIONS

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates	
							East (m)	North (m)
Operational Impacts								
CO	1 hour	120.37	NA	7,705	7,825.4	23,000	241,550	4,077,850
	8 hour	26.21	NA	5,156	5,182.2	10,000	241,400	4,077,900
NO_2	1 hour	164.87	NA	112.8	277.7	470	241,575	4,078,700
	1 hour normal	164.87	NA	112.8	277.7	470	241,575	4,078,700
	Annual	0.04	NA	22.64	22.7	100	241,700	4,078,725
PM_{10}	24 hour	0.2	NA	193.0 [3]	193.2	50	241,400	4,077,800
	Annual	0.02	NA	43.0 [3]	43.0	20	246,150	4,074,900
$PM_{2.5}$	24 hour	0.2	NA	110.2 [3]	110.4	35	241,400	4,077,800
	Annual	0.02	NA	21.7 [3]	21.7	12	246,150	4,074,900
SO_2	1 hour	0.74	NA	23.6	24.3	655	241,550	4,077,850
	3 hour	0.25	NA	15.6	15.9	1,300	241,550	4,077,850
	24 hour	0.05	NA	10.5	10.6	105	241,400	4,077,900
	Annual	0.004	NA	5.3	5.3	80	247,250	4,074,000

Notes:

µg/m³ = micrograms per cubic meter
CO = carbon monoxide
ISCST3 = USEPA Industrial Source Complex model, Version 02035
m = meters
NA = Not applicable
NAAQS = Most stringent ambient air quality standard for the averaging period
NO_2 = nitrogen dioxide
OLM = ozone limiting method
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter.
PSD = Prevention of Significant Deterioration
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

[1] Source: 40 CFR 52.21.

[2] Background represents the maximum values measured at Fresno First St. (CO, NO_2, PM_{10}, $PM_{2.5}$) or Fresno Fremont School (SO_2) monitoring stations, 2001-2005, depending on pollutant.

[3] PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

TECHNICAL AREA: AIR QUALITY

Data Request 10 Rev: Please identify the locations and heights of the top of the water park slides and model the initial commissioning and startup/shutdown operating emission scenarios to determine maximum short-term impacts (1 and 8-hour) that could occur at those elevated locations. Please provide electronic copies of these modeling input/output files.

Response:

There are five elevated water slides identified at the Island Water Park. The heights of the slides were provided by the park's operator and UTM coordinates for the slides were determined from aerial photographs of the project area. The resulting information is presented in the table below.

Water Park Slide Heights and Location Coordinates

Slide Name	Nature's Fury	The Shark Tank	The Red Wave	Bamboo Chutes	The Drop Zone
Height	50 feet 15.24 meters	None given assumed 50 feet 15.24 meters	70 ft, 66 ft personnel platform – 68 feet used 20.73 meters	None given assumed 50 feet 15.24 meters	70 ft, 66 ft personnel platform – 68 feet used 20.73 meters
UTM E	241562	241637.5	241758	241756	241779
UTM N	4078015	4078013	4077947	4077855	4077823
Base Elevation	91.6 meters	91.7 meters	91.7 meters	91.7 meters	91.7 meters

Revised dispersion modeling was conducted to incorporate the turbine commissioning exhaust parameters developed in the response to Data Request 8 and included elevated ("flagpole") receptors at the tops of the five water slides listed above. Predicted maximum short-term NO2 and CO concentrations at these special receptors are presented in the top half of the following table and the maximum predicted values at all other receptors are presented in the bottom half of the table.

REVISED ISCST3 MODELING RESULTS FOR BEC TURBINE COMMISSIONING

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Impact Level[1] ($\mu g/m^3$)	Background[2] ($\mu g/m^3$)	Maximum Total Predicted Concentration ($\mu g/m^3$)	Most Stringent AAQS ($\mu g/m^3$)	UTM Coordinates	
							East (m)	North (m)
Maximum Predicted Concentrations at Elevated Water Slide Receptors								
CO	1 hour	120.3	NA	7,705	7,825.3	23,000	241,550	4,077,825
	8 hour	19.8	NA	5,156	5,175.8	10,000	241,525	4,077,950
NO_2	1 hour	66.2	NA	112.8	179.0	470	241,550	4,077,825
Maximum Predicted Concentrations – All Receptors								
CO	1 hour	102.8	NA	7,705	7,807.8	23,000	241,756	4,077,855
	8 hour	17.2	NA	5,156	5,173.2	10,000	241, 756	4,077,855
NO_2	1 hour	56.5	NA	112.8	169.3	470	241, 756	4,077,855

TECHNICAL AREA: AIR QUALITY

Data Request 11 Rev: Please identify how many heavy haul trips will be necessary to clear the existing equipment/debris currently located on the site, and indicate where it will be shipped.

Response:

The revised construction emissions tables introduced in the response to Data Request 19 show the emissions associated with heavy duty vehicle trips. Specifically emissions for these trips may be seen on the spreadsheets for Debris Removal (see Appendix A, Attachment 19-1), which represent the removal of 18,000 cubic yards of concrete, asphalt, debris and soils. The table below presents the requested information regarding these heavy vehicle trips. The debris will be sent to a landfill.

Estimated Heavy Vehicle Trips Associated with Specific BEC Construction Activities

Activity	Duration (months)	Engine Horsepower/Cubic Yards	Maximum Heavy Vehicle Trips for Activity	Assumed Two-Way Trip Distance (miles)	Total Vehicle Miles	Vehicle Miles per Day*
Debris Removal	2	300/25	1,187	10	23,733	539.4

* Daily miles estimated based on 22 work days per month

TECHNICAL AREA: AIR QUALITY

Data Request 12 Rev: The Geotechnical report, Appendix L of the AFC, appears to indicate fine soils exist at and near the surface of the site, with approximately 30 to 40 percent silt content for the three sieved samples. Please describe how much of the surface soils (in cubic yards) will need to be removed, how much fill will need to be imported, and describe the final disposal approach for the removed soils.

Response:

A total of 17,800 cubic yards of debris and soils will be removed from the site. Approximately 36,000 cubic yards of soils will be imported to the site. The imported soils will be used as fill onsite. The soils removed from the site will be sent to a local landfill.

TECHNICAL AREA: AIR QUALITY

Data Request 13 Rev: It is assumed that emulsified diesel fuel among several other exotic diesel engine mitigation measures are used in the URBEMIS model runs. These mitigation measures are not mentioned in other areas of the AFC. Please confirm or refute that the use of emulsified diesel and the other URBEMIS identified measures can be stipulated for construction, or remove them from the analysis.

Response:

As noted in subsequent responses, the construction emissions have been recalculated using spreadsheets, rather than the URBEMIS mode, and South Coast AQMD emission factors recommended by CEC, which do not assume the use of emulsified diesel fuel.

TECHNICAL AREA: AIR QUALITY

Data Request 14 Rev: There are problems with the URBEMIS model that cause fugitive dust emission mitigation efficiency to be grossly overestimated. In the case of the URBEMIS model runs provided with this estimate, the overall mitigation efficiency for fugitive dust control is over 85 percent even though no single fugitive dust operation would be controlled by more than 60 percent with the given inputs. Please provide an appropriate correction for the fugitive dust mitigation efficiency overestimate by URBEMIS considering the applicant's proposed fugitive dust mitigation measures.

Response:

As described in subsequent responses, pollutant emissions for all construction activities have been recalculated using a revised approach in place of the URBEMIS model. The spreadsheets introduced in the response to Data Request 19 clearly show the level of dust control assumed for each activity. In most cases, an 85% reduction in dust emissions was credited for watering the site at least three times daily or applying chemical dust suppressants on disturbed bare areas.

TECHNICAL AREA: AIR QUALITY

Data Request 15 Rev: Other URBEMIS model inputs appear to be problematic. For example: 1) the fugitive dust basis uses non-conservative default model values when the site is known to have fine soils, 10 lbs/acre versus the worst-case 38.2 lbs/acre; and 2) the construction schedule start date is too early considering the time necessary for licensing/permitting and the number of months are inconsistent with the overall 16 month schedule provided in Appendix I Attachment B Table IB-1. Please review all of the modeling inputs, correct as necessary based on this request and other applicable data requests using URBEMIS or an alternative more site specific emission estimating approach and resubmit the construction emission estimates. If the URBEMIS modeling runs are revised please also submit the electronic input and output files.

Response:

The current schedule for BEC construction is shown below A new Excel workbook with separate spreadsheets showing the equipment exhaust and fugitive dust emissions estimates for each construction activity has been prepared in lieu of the previous URBEIS2002 model calculations and provides emissions. The spreadsheets, which are presented in the response to Data Request 19 and are included in Appendix A, Attachment 19-1, are annotated to document the sources of emission factors and assumptions used in developing the emissions estimates.

Estimated Construction Schedule for BEC
(Activities are sequential, no overlap of activities except where noted)

*Natural Gas Pipeline
Duration: 1 month

*Water/Sewer Line Installation
Duration: 3 months, 1 month overlap with NG pipeline work

Concrete/Asphalt Removal
Duration: 2 months

Civil Work (site grading)
Duration: 2 months

#Concrete Pours (building)
Duration: 2 months piling, 8 months concrete pouring overlap with switchyard work

TOTAL CONSTRUCTION DURATION
17 months

* - 1 month overlap with natural gas pipeline and water/sewer line construction
# - 5 month overlap with switchyard work and concrete pours

TECHNICAL AREA: AIR QUALITY

Data Request 16 Rev: It is unclear from the simplified on-road vehicle emission calculation method whether the worst case day and annual on-road emissions are correctly estimated. There are likely to be construction periods that would require comparatively higher numbers of heavy truck trips. For this project, that would likely occur when major concrete pours are required for the foundation. To confirm the on-road emission estimates, please identify the maximum number of daily heavy vehicle trips and Vehicle Miles Traveled (VMT) necessary during peak periods and the total number of heavy vehicle trips, by type and assumed round trip locations, needed for all preconstruction and construction activities.

Response:

The new Excel workbook that has been prepared to estimate emissions form all BEC sources, including heavy truck trips for different construction phases is presented in the response to Data Request 19, included are EMFAC2002 model runs used to estimate emissions from vehicle trips associated with the construction effort.

TECHNICAL AREA: AIR QUALITY

Data Request 17 Rev: Please provide a PM2.5 emission estimate for the construction phase. For engine emissions please either assume 100% of engine particulate emissions are PM2.5 or use approved California Air Resources Board (CARB) California Emission Inventory Development and Reporting System (CEIDARS) particulate size speciation profiles. For fugitive dust emissions, please use approved CEIDARS particulate size speciation profiles, or if USEPA fugitive dust emission factor calculations are used, use the appropriate referenced procedures for those methods.

Response:

The revised emission calculations presented in the response to Data Request 19 to include PM2.5 emissions estimates for fugitive dust and exhaust sources based on the CEIDARS data base.

TECHNICAL AREA: AIR QUALITY

Data Request 18 Rev: The presentation of the URBEMIS results in Appendix I Attachment B is incomplete and has errors, such as indicating that it was information from another model rather than from URBEMIS. If the revised emission calculations are performed using URBEMIS, please provided a corrected hardcopy presentation of the results.

Response:

A new Excel workbook with separate spreadsheets showing the equipment exhaust and fugitive dust emissions estimates for each construction activity has been prepared in lieu of the previous URBEIS2002 model calculations. The spreadsheets are annotated to document the sources of emission factors and assumptions used in developing the emissions estimates, and are presented in the response to Data Request 19.

TECHNICAL AREA: AIR QUALITY

Data Request 19 Rev: The construction schedule assumption in the emission calculations shows construction will occur eight hours a day; however, the modeling files do not use hourly emission factors for the actual hours of the day construction will occur. Additionally, the PM10 modeling did not include the PM10 fugitive dust emissions. Please rerun the construction emissions modeling analysis using appropriate hourly emission factors for the hours in the day assumed for construction and add appropriate fugitive dust emission sources in the PM10 model run. Also as noted previously, please combine receptors and meteorological files to reduce the number of modeling runs by a factor of ten.

Response:

Attachment 19-1 in Appendix A is the Excel Workbook that has been prepared to estimate emissions from all BEC construction activities. These worksheets incorporate changes intended to address the issues raised in Data Requests 11 through 18. Dispersion model runs have been made incorporating the revised construction emission, as described below.

The BEC construction effort will be comprised of a number of separate activities occurring at different times over a 17-month period. Each phase of construction will require different numbers and sizes of construction equipment operating at different locations within the BEC site. Thus it is not obvious which activity would be likely to produce the highest offsite concentrations of air pollutants. Accordingly, several different candidate scenarios were modeled to ensure that worst-case impacts would in fact be addressed. Experience shows that the pollutants and averaging times that are generally most important for construction emissions in California are: 1-hour NO_2 concentrations and 24-hour PM_{10}/$PM_{2.5}$ concentrations; therefore scenarios that would maximize potential offsite impacts for these values were chosen. The main criteria for selecting these modeling scenarios were magnitude of estimated emissions, activity duration and proximity of emission sources to the BEC site boundary. The four selected scenarios are:

- Gas and Water Line Expansion (Months 1 to 3)
- Debris Removal (Months 4 and 5)
- Site Grading (Months 6 and 7)
- Site Building (Months 8 – 17)

For each scenario, short-term impacts were modeled using the largest equipment grouping (in terms of potential emissions) that would be expected to cause the highest emissions on the same day. All construction activities were assumed to occur during an 8-hour day. Calculation of annual emissions assumed all construction activities that would occur over a 12-month period.

The results of the revised modeling are summarized in the Revised Table 5.2-18A below. Full electronic copies of the construction phase modeling input/output files are provided on an accompanying CD along with the operational modeling files.

Table 5.2-18A (1st of 4 Parts)
ISCST3 Modeling Results

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates	
							East (m)	North (m)
Construction Impacts – Gas and Water Lines								
CO	1 hour	335.89	NA	7,705	8,040.9	23,000	241,425	4,079,025
	8 hour	95.61	NA	5,156	5,251.6	10,000	241,550	4,078,925
NO_2	1 hour[3]	80.63	NA	112.8	213.4	470	240,200	4,078,900
	Annual	0.39	NA	22.64	23.0	100	241,525	4,078,950
PM_{10}	24 hour	33.29	NA	193.0 [4]	226.3	50	241,425	4,079,025
	Annual	0.15	NA	43.0 [4]	43.2	20	242,500	4,078,100
$PM_{2.5}$	24 hour	11.53	NA	110.2 [4]	121.7	35	241,425	4,079,025
	Annual	0.04	NA	21.7 [4]	21.7	12	242,500	4,078,100
SO_2	1 hour	1.65	NA	23.6	24.3	655	240,200	4,078,900
	3 hour	0.7	NA	15.6	16.3	1,300	241,425	4,079,025
	24 hour	0.24	NA	10.5	10.7	105	241,425	4,079,025
	Annual	0.001	NA	5.3	5.3	80	241,475	4,079,000

Notes:

µg/m³ = micrograms per cubic meter
CO = carbon monoxide
ISCST3 = USEPA Industrial Source Complex model, Version 02035
m = meters
NA = Not applicable
NAAQS = Most stringent ambient air quality standard for the averaging period
NO_2 = nitrogen dioxide
OLM = ozone limiting method
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter.
PSD = Prevention of Significant Deterioration
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

[1] Source: 40 CFR 52.21

[2] Background represents the maximum values measured at Fresno First St. (CO, NO_2, PM_{10}, $PM_{2.5}$) or Fresno Fremont School (SO_2) monitoring stations, 2001-2005

[3] Results for 1-hour NO_2 during construction used ozone limiting method (OLM) to estimate NO_2 impacts. Ozone measurement at Fresno First St monitoring station for the same hour of meteorological data as maximum predicted 1-hour NOx concentration (2/4/91 hour 8) was used in the OLM calculation

[4] PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

Table 5.2-18A (2nd of 4 Parts)
ISCST3 Modeling Results

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates East (m)	UTM Coordinates North (m)
Construction Impacts – Debris Removal								
CO	1 hour	287.65	NA	7,705	7,992.7	23,000	241,327	4,078,544
	8 hour	94.49	NA	5,156	5,250.5	10,000	241,527	4,078,680
NO_2	1 hour[3]	86.67	NA	112.8	239.5	470	241,327	4,078,544
	Annual	1.05	NA	22.64	23.7	100	241,527	4,078,680
PM_{10}	24 hour	47.12	NA	193.0 [4]	240.1	50	241,480	4,078,626
	Annual	1.27	NA	43.0 [4]	44.3	20	241,449	4,078,774
$PM_{2.5}$	24 hour	13.31	NA	110.2 [4]	123.5	35	241,480	4,078,626
	Annual	0.15	NA	21.7 [4]	21.9	12	241,449	4,078,774
SO_2	1 hour	1.26	NA	23.6	24.9	655	241,327	4,078,544
	3 hour	0.49	NA	15.6	16.1	1,300	241,351	4,078,662
	24 hour	0.18	NA	10.5	10.7	105	241,543	4,078,698
	Annual	0.001	NA	5.3	5.3	80	241,527	4,078,680

Notes:

µg/m³ = micrograms per cubic meter
CO = carbon monoxide
ISCST3 = USEPA Industrial Source Complex model, Version 02035
m = meters
NA = Not applicable
NAAQS = Most stringent ambient air quality standard for the averaging period
NO_2 = nitrogen dioxide
OLM = ozone limiting method
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter.
PSD = Prevention of Significant Deterioration
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

[1] Source: 40 CFR 52.21

[2] Background represents the maximum values measured at Fresno First St. (CO, NO_2, PM_{10}, $PM_{2.5}$) or Fresno Fremont School (SO_2) monitoring stations, 2001-2005

[3] Results for 1-hour NO2 during construction used ozone limiting method (OLM) to estimate NO_2 impacts. Ozone measurement at Sierra Sky Park monitoring station for the same hour of meteorological data as maximum predicted 1-hour NOx concentration (2/5/88 hour 8) was used in the OLM calculation

[4] PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

Table 5.2-18A (3rd of 4 Parts)
ISCST3 Modeling Results

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates East (m)	UTM Coordinates North (m)
Construction Impacts – Site Grading								
CO	1 hour	889.5	NA	7,705	8,594.5	23,000	241,327	4,078,544
	8 hour	292.2	NA	5,156	5,448.2	10,000	241,527	4,078,680
NO_2	1 hour[3]	231.3	NA	112.8	384.1	470	241,327	4,078,544
	Annual	2.79	NA	22.64	25.4	100	241,527	4,078,680
PM_{10}	24 hour	41.1	NA	193.0 [4]	234.1	50	241,480	4,078,626
	Annual	0.96	NA	43.0 [4]	44.0	20	241,527	4,078,680
$PM_{2.5}$	24 hour	17.78	NA	110.2 [5]	128.0	35	241,543	4,078,698
	Annual	0.99	NA	21.7 [5]	22.7	12	241,591	4,078,751
SO_2	1 hour	3.78	NA	23.6	27.4	655	241,327	4,078,544
	3 hour	1.44	NA	15.6	17.0	1,300	241,600	4,078,872
	24 hour	0.53	NA	10.5	11.0	105	241,543	4,078,698
	Annual	0.0002	NA	5.3	5.3	80	241,527	4,078,680

Notes:

µg/m³ = micrograms per cubic meter
CO = carbon monoxide
ISCST3 = USEPA Industrial Source Complex model, Version 02035
m = meters
NA = Not applicable
NAAQS = Most stringent ambient air quality standard for the averaging period
NO_2 = nitrogen dioxide
OLM = ozone limiting method
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter.
PSD = Prevention of Significant Deterioration
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

1 Source: 40 CFR 52.21

2 Background represents the maximum values measured at Fresno First St. (CO, NO_2, PM_{10}, $PM_{2.5}$) or Fresno Fremont School (SO_2) monitoring stations, 2001-2005

3 Results for 1-hour NO2 during construction used ozone limiting method (OLM) to estimate NO_2 impacts. Ozone measurement at Sierra Sky Park monitoring station for the same hour of meteorological data as maximum predicted 1-hour NOx concentration (2/5/88 hour 8) was used in the OLM calculation

4 PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

Table 5.2-18A (4th of 4 Parts)
ISCST3 Modeling Results

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates East (m)	UTM Coordinates North (m)
Construction Impacts – Building								
CO	1 hour	696.4	NA	7,705	8,401.4	23,000	241,327	4,078,544
	8 hour	228.8	NA	5,156	5,384.8	10,000	241,527	4,078,680
NO_2	1 hour[3]	179.4	NA	112.8	292.2	470	241,327	4,078,544
	Annual	12.1	NA	22.64	34.7	100	241,527	4,078,680
PM_{10}	24 hour	18.6	NA	193.0 [4]	211.6	50	241,543	4,078,698
	Annual	1.01	NA	43.0 [4]	44.0	20	241,449	4,078,774
$PM_{2.5}$	24 hour	11.46	NA	110.2 [5]	121.7	35	241,543	4,078,698
	Annual	0.58	NA	21.7 [5]	22.3	12	241,527	4,078,680
SO_2	1 hour	1.51	NA	23.6	25.1	655	241,327	4,078,544
	3 hour	0.59	NA	15.6	16.2	1,300	241,351	4,078,662
	24 hour	0.21	NA	10.5	10.7	105	241,543	4,078,698
	Annual	0.01	NA	5.3	5.3	80	241,527	4,078,680

Notes:

µg/m³ = micrograms per cubic meter
CO = carbon monoxide
ISCST3 = USEPA Industrial Source Complex model, Version 02035
m = meters
NA = Not applicable
NAAQS = Most stringent ambient air quality standard for the averaging period
NO_2 = nitrogen dioxide
OLM = ozone limiting method
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter.
PSD = Prevention of Significant Deterioration
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

1 Source: 40 CFR 52.21

2 Background represents the maximum values measured at Fresno First St. (CO, NO_2, PM_{10}, $PM_{2.5}$) or Fresno Fremont School (SO_2) monitoring stations, 2001-2005

3 Results for 1-hour NO2 during construction used ozone limiting method (OLM) to estimate NO_2 impacts. Ozone measurement at Sierra Sky Park monitoring station for the same hour of meteorological data as maximum predicted 1-hour NOx concentration (2/5/88 hour 8) was used in the OLM calculation

4 PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

TECHNICAL AREA: AIR QUALITY

Data Request 20 Rev: The AFC notes that the ozone limiting method (OLM) is used for the 1-hour NO2 impact determination. However, no NOx_OLM modeling files or simplified OLM method calculations are provided to confirm the results presented for the 1-hour NOx impacts. Please provide the NOx_OLM input/output files, including ozone input files if NOx_OLM was used, or provide the simplified OLM calculations and assumptions if that method was used to determine worst case 1-hour NOx impacts. Please note that other modeling corrections may be necessary based on the other data requests regarding construction emission estimates.

Response:

The ozone limiting method was applied to predict maximum one-hour ozone concentrations during construction. NOx OLM could not be used because that model only works properly with point source emission input data, whereas certain construction sources, such as exhaust from moving equipment within the site, are more appropriately represented as volume sources. Accordingly, a simple hand calculation was made to estimate the portion of the maximum predicted 1-hour NOx concentrations for each modeled construction activity that would be converted to NO2. The hourly ozone data used for this purpose was the value recorded at the Fresno 1st Street and Sierra Sky Park monitoring stations for the same hour of the meteorological input data record that produced the highest NOx concentration in ISCST3. Separate model runs were conducted for several different tasks (scenarios) that were selected to ensure that maximum offsite pollutant concentrations would be addressed.

Among the different candidate construction scenarios modeled, the highest predicted hourly NOx concentration (2,312.6 µg/m3) occurred for Site Grading. This value was predicted to occur with the meteorological input data for February 5, 1988. The ozone concentration recorded at Sierra Sky Park during this hour was 20 parts per billion or 0.02 parts per million (40 µg/m3). The ozone limiting calculation is:

$$[NO_2]_{ann} = \{(0.1) \times [NO_x]_{pred}\} + MIN\{(0.9) \times [NO_x]_{pred}, \text{ or } (46/48) \times [O_3]_{bkgd}\}$$

where

$[NO_2]_{ann}$ is the predicted annual NO_2 concentration
$[NO_x]_{pred}$ is the model predicted annual NO_x concentration
MIN means the minimum of the two quantities within the brackets
$[O_3]_{bkgd}$ is the representative annual average ambient O3 concentration
(46/48) is the molecular weight of NO_2 divided by the molecular weight of O_3

Substituting the values obtained for February 5, 1988 yields a project NO2 impact of 271.3 µg/m3. When this is added to the conservative background NO2 concentration of 112.8 µg/m3 used throughout the modeling analyses, the resulting total concentration is 384.1 µg/m3.

TECHNICAL AREA: AIR QUALITY

Data Request 21 Rev: Please provide a copy of the District's correspondence regarding existing and planned cumulative projects located within six miles of the BEC site. Once this correspondence is provided, then staff will work with the applicant to decide which sources to include in the cumulative analysis required in Data Request 22.

Response:

Although BEC has made several e-mail requests with follow-up telephone calls to SJVAPCD beginning in June of 2006 for information on existing and planned cumulative projects within six miles, no response has yet been received.

TECHNICAL AREA: AIR QUALITY

Data Request 22 Rev: Please provide the cumulative modeling analysis including all District identified cumulative sources no later than one month prior to the scheduled publication date of the Preliminary Staff Assessment.

Response:

The required cumulative modeling analysis will be conducted as soon as the requested information on existing and planned cumulative projects has been provided by SJVAPCD.

TECHNICAL AREA: ALTERNATIVES

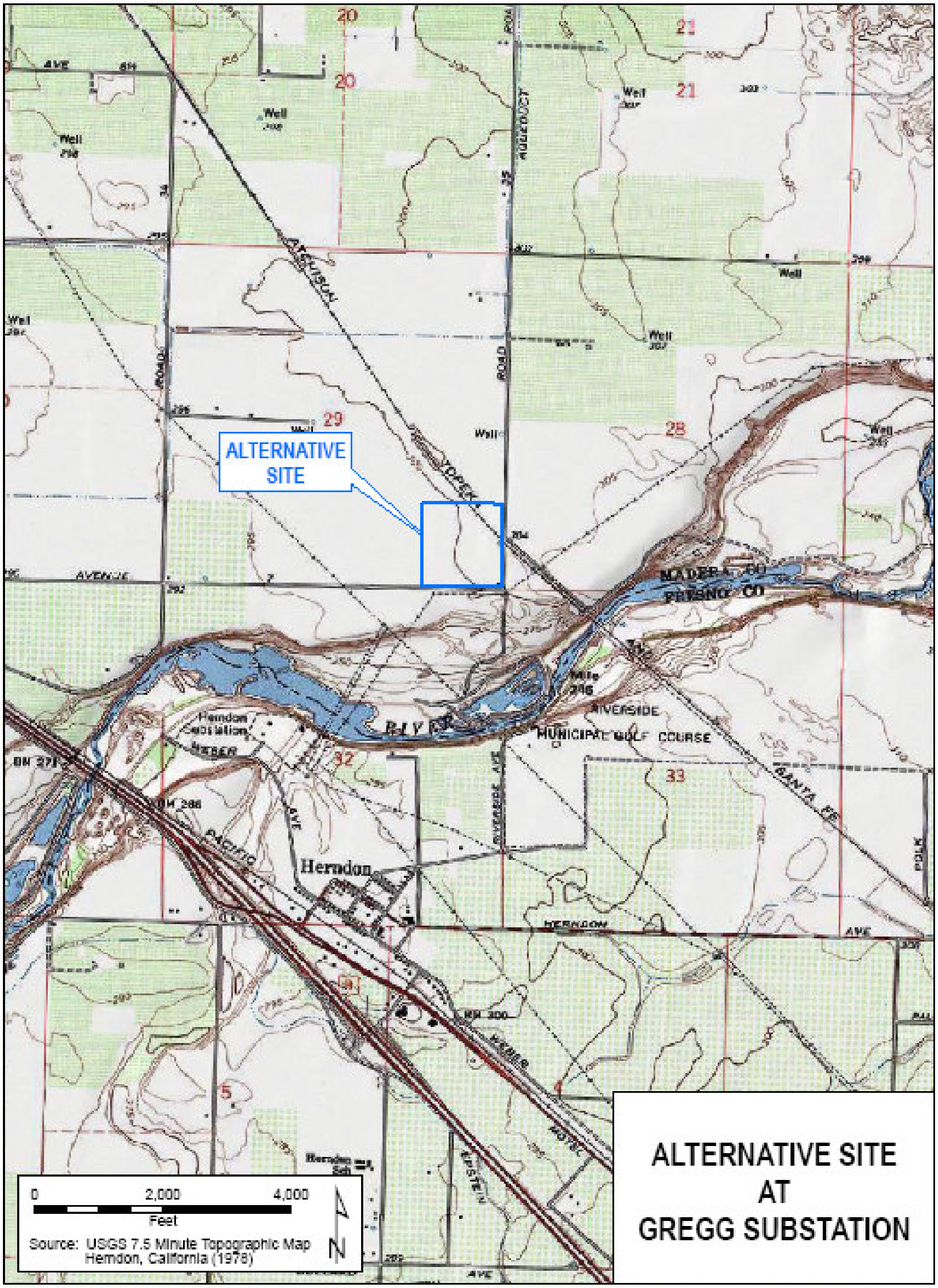
Data Request 23 Rev: Please provide a detailed description (including a map, acreage, elevation, topography) of the alternative sites that were considered.

Response:

Sites that were reviewed prior to preparing a proposal to PG&E in 2005 included the proposed location, the area around the Gregg Substation, the Kearney Substation and the Herndon Substation. At that time a site that could provide power into the Herndon Substation was very desirable to PG&E.

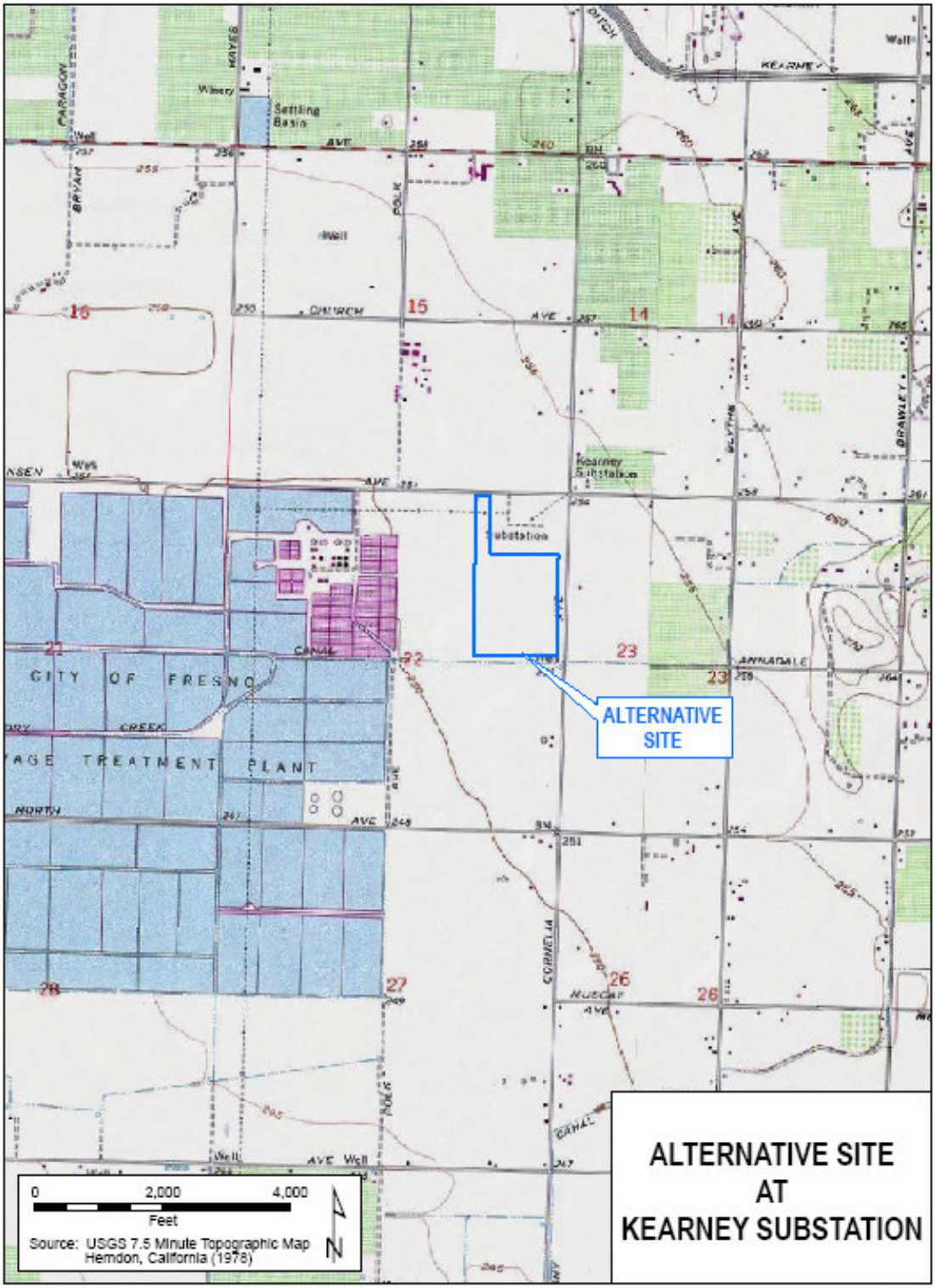
Gregg Substation

The Gregg Substation is located in Madera County approximately one mile east of Highway 99 on Avenue 7. Landowners were contacted regarding availability of land. One landowner was in the process of selling to a residential developer and other agricultural land owners refused to consider selling any of their land. Thus no land near this substation was available for siting a new power plant or transmission line to connect to the substation. No natural gas is reasonably available to this location. [Also PG&E advised us that Gregg was not a desirable location for new generation due to various electrical transmission impacts arising from operations of the Helms pumped hydro plant.] Refer to the aerial photograph below and the figure titled Alternative Site at Gregg Substation.


ALTERNATIVE SITE
ALTERNATIVE SITE
AT
GREGG SUBSTATION
0
2,000
4,000
Feet
Source: USGS 7.5 Minute Topographic Map
Herndon, California (1978)
N
Herndon
MADERA CO
FRESNO CO
RIVERSIDE
MUNICIPAL GOLF COURSE
SANTA FE
ATCHISON
TOPEKA
PACIFIC
AQUEDUCT
Herndon Substation

Kearney Substation

The Kearney Substation is located in Fresno County on the southwest corner of Cornelia and Jenson. The site considered was immediately south of the substation on land owned by the City of Fresno and is part of its wastewater treatment plant complex. The City of Fresno had previously stated that it would not make the land available for a power plant. Thus this site was also not available for construction of a power plant. Had this land been available, PG&E would have required a reconducturing of the line from the Kearney Substation to the Herndon Substation which would have been prohibitively expensive for a small power plant. Refer to the below figure titled Alternative Site at Kearney Substation.


ALTERNATIVE SITE
Kearney Substation
Substation
CITY OF FRESNO
TREATMENT PLANT
CANAL
CHURCH
AVE
Well
Settling Basin
Winery
0
2,000
4,000
Feet
Source: USGS 7.5 Minute Topographic Map
Herndon, California (1978)
N
ALTERNATIVE SITE
AT
KEARNEY SUBSTATION

Herndon Substation

The Herndon Substation is located in the northwest corner of the City of Fresno and is bordered on the north by the San Joaquin river. PG&E owns approximately 80 acres immediately surrounding the substation. PG&E made the decision not to make any of its land available either by purchase or lease for independently owned power plants. Such a sale or lease by PG&E would have been preferential treatment in the competitive bidding process. The PG&E land that could have potentially been available is utilized by PG&E for a web of high pressure gas lines and high voltage transmission lines. Land south of the PG&E land is master planned as light industrial but was not available for purchase or lease. Land to the east was also not available for purchase or lease and would not have been an acceptable location as it is master planned for residential. The following aerial photograph depicts the Herndon Substation and its surrounding land uses.

TECHNICAL AREA: ALTERNATIVES

Data Request 24 Rev: For each alternative site, please provide a brief analysis of all environmental issue areas that were examined for the proposed project site. Enough information should be provided for each issue area in order to determine which site has a greater impact.

Response:

Environmental issue analyses were not performed for any of the three alternative sites discussed in the response to Data Request 23, since in each case the landowners were unwilling to make those sites available for the project.

TECHNICAL AREA: ALTERNATIVES

Data Request 25 Rev: Please provide a detailed description as to why the proposed project site best suits the requirements of PG&E and its customers and why it is preferred in comparison to the alternative sites.

Response:

PG&E Transmission Planning representatives advised the developer as early as 2001 that new peaking generation was needed in the north Fresno area, and that interconnection at Herndon substation was preferred. During the competitive bidding process for new peaking plants conducted by PG&E during the period November 2004 through April 2006, under direction and supervision of the California Public Utilities Commission, six proposals at six different locations in the greater Fresno area were presented by various developers and analyzed by PG&E. The BEC proposal was one of those six proposals. The sites offered by different bidders were further scrutinized by a Procurement Review Group and an Independent Evaluator, appointed by the CPUC and according to CPUC approved procedures. After consideration of all factors deemed significant by PG&E and the outside evaluators, the Bullard Energy Center site was chosen as the most economical proposal and the preferred location for new peaking generation in the Fresno area. The CPUC approved a contract between BEC and PG&E for construction of this project. Five alternative sites offered by competing bidders were thus rejected as undesirable.

With respect to the alternative sites near Gregg substation, Kearney substation and Herndon substation, discussed above, the developer determined that none were genuine alternatives because in each instance the landowners chose not to make land available. The industrial site chosen by BEC is therefore the only feasible location to construct and interconnect new peaking generation to meet the criteria desired by PG&E, as set forth in the contract between PG&E and BEC, and these putative “alternative sites” were not further considered.

TECHNICAL AREA: ALTERNATIVES

Data Request 26 Rev: Please provide a detailed description as to why each of the alternate technologies EIF considered for the BEC project would not meet its goals and objectives.

Response:

Selection of the power generation technology focused on those technologies that can utilize the natural gas readily available from the existing transmission system. Following is a discussion of the suitability of such technologies for application at PEC.

Conventional Boiler and Steam Turbine

This technology burns fuel in the furnace of a conventional boiler to create steam. The steam is used to drive a steam turbine-generator, and the steam is then condensed and returned to the boiler. This is an outdated technology that is able to achieve thermal efficiencies up to approximately 36 percent when utilizing natural gas, although efficiencies are somewhat higher when utilizing oil or coal. Because of this low efficiency and large space requirement, the conventional boiler and steam turbine technology was eliminated from consideration.

Conventional Simple-Cycle Combustion Turbine

Conventional aeroderivative turbine-generator units are able to achieve thermal efficiencies up to approximately 38 percent. In comparison, the LMS100 turbine-generator can achieve efficiencies of up to 44 percent. The LMS100 also has a quick startup capability and is very appropriate for peaking applications. Because of its relatively low efficiency, conventional simple-cycle technology tends to emit more air pollutants per kilowatt-hour generated than the LMS100 will. Because of this relatively low efficiency, the conventional simple-cycle combustion turbine technology was eliminated from consideration.

Conventional Combined-Cycle

This technology integrates combustion turbines and steam turbines to achieve higher efficiencies. The combustion turbine's hot exhaust is passed through a heat recovery system generator (HRSG) to create steam used to drive a steam turbine-generator. This technology is able to achieve high thermal efficiencies. The combined-cycle alternative, however, requires very large capital cost more appropriate for a baseload facility, a large site, and very large quantities of water for cooling. In addition, conventional combined-cycle technology cannot match the GE Energy LMS100 technology for rapid startup, sustained hot-day power, efficient cycling, and high part-power efficiency and load following capability. These are essential characteristics for a peaking facility.

Fuel Technology Alternatives

Technologies based on fuels other than natural gas were eliminated from consideration because they do not meet the project objective of utilizing natural gas available from PG&E for a "tolling arrangement" agreements. Additional factors rendering alternative fuel technologies unsuitable for the proposed project are as follows:

- The Applicant was unable to identify any feasible and available geothermal or hydroelectric resources in Fresno County. Further, these technologies do not meet the dispatchability requirements of the PG&E contract.

- Biomass fuels such as wood waste are not locally available in sufficient quantities to deliver 200 WM and emissions would be significantly greater.

- Solar and wind technologies are generally not dispatchable and are therefore not capable of producing ancillary services other than reactive power as required in the PG&E contract.

- Coal and oil technologies emit more air pollutants than technologies utilizing natural gas.

- Nuclear technology was dismissed because it would be impossible to permit the plant soon enough to deliver power in 2009 as required by the PG&E contract.

- The availability of the natural gas resource provided by PG&E as well as the environmental and operational advantages of natural gas technologies, make natural gas the logical choice for the proposed project.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 27 Rev: Please provide any supporting documents (letter or record of conversation) that resulted from communication with USFWS and CDFG regarding potential impacts to the state and federally listed San Joaquin kit fox. Please provide contact information for the USFWS and CDFG agency personnel that were contacted.

Response:

CDFG

TELEPHONE CONVERSATION RECORD

URS

COPIES TO:

130 Robin Hill Road, Ste. 100, Santa Barbara, California 93117
805.964-6010 FAX 805.964.0259

DATE	July 19, 2006	TIME	9 am
TO	**Julie Lance**	FROM	**Johanna LaClaire**
COMPANY	**California Department of Fish and Game** Habitat Conservation Planning Branch		
ADDRESS	1416 Ninth St., Sacramento, CA 95814	PHONE NO.	559-243-4014 x222
PROJ NAME	**Bullard AFC**	PROJ/TASK NO.	**28906905**

Spoke with Julie Lance on July 19, 2006. She said we would not need to conduct protocol level surveys for San Joaquin kit fox since the habitat at the project site is not suitable for dens; however, she referred me to guidelines on avoidance and minimization measures for San Joaquin kit fox foraging habitat found in "Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance" (Sacramento Fish & Wildlife Office, US Fish & Wildlife Service, 6/1999) located on the CDFG Habitat Conservation Planning Branch website (http://www.dfg.ca.gov/hcpb/species/stds_gdl/survmonitr.shtml #MAMMALS). These guidelines were followed when preparing the biology section for the AFC (see attached).

The guidelines referenced in the above CDFG record of conversation are included as Appendix D.

USFWS

Jeff Jorgenson (USFWS, San Joaquin Valley Branch) was contacted on March 01, 2007. Information regarding the project was provided, including the CDFG record of conversation. Jeff informally said that he would try to have a response to URS by March 16, 2007. This response will be forwarded to the CEC upon receipt.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 28 Rev: Please confirm whether Gas Routes B and C were surveyed for cultural resources.

a. If the two routes have been surveyed, please describe the results of the survey and if applicable: discuss the eligibility of any identified cultural resources for inclusion in the California Register of Historical Resources (CRHR), any potential construction-related impacts to CRHR-eligible cultural resources, and recommended mitigation measures. Please record any discovered or newly identified cultural resources on a Department of Parks and Recreation (DPR) form 523 and provide a copy of the form.

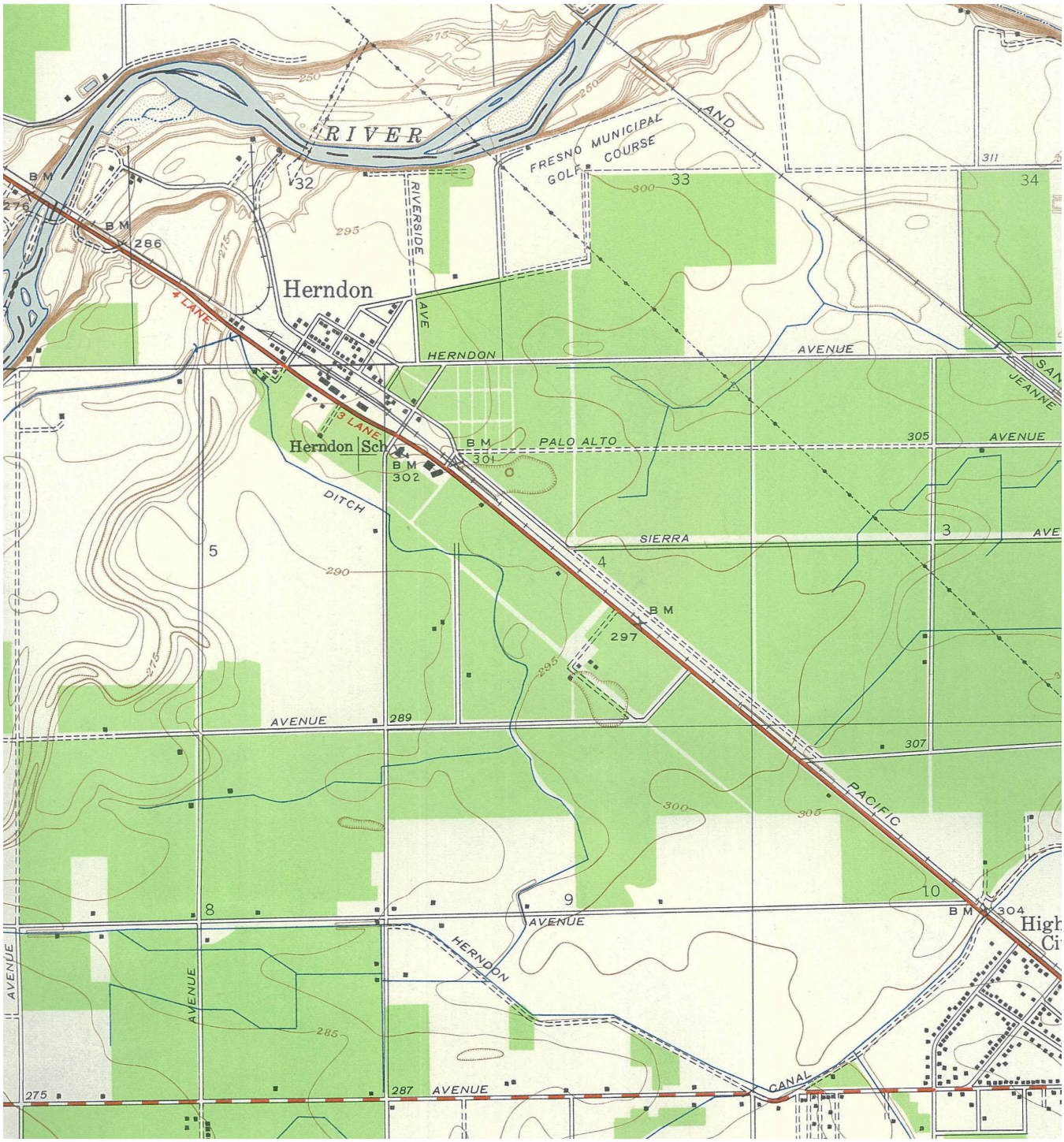
b. If Gas Routes B and C have not been surveyed for cultural resources, please conduct cultural resource surveys for both routes and provide the results. If cultural resources are identified: address their eligibility for inclusion in the CRHR, potential construction-related impacts to the CRHR-eligible resources; and if applicable, recommended mitigation measures. Please record any discovered or newly identified cultural resources on a DPR 523 form and provide a copy of the form.

Response:

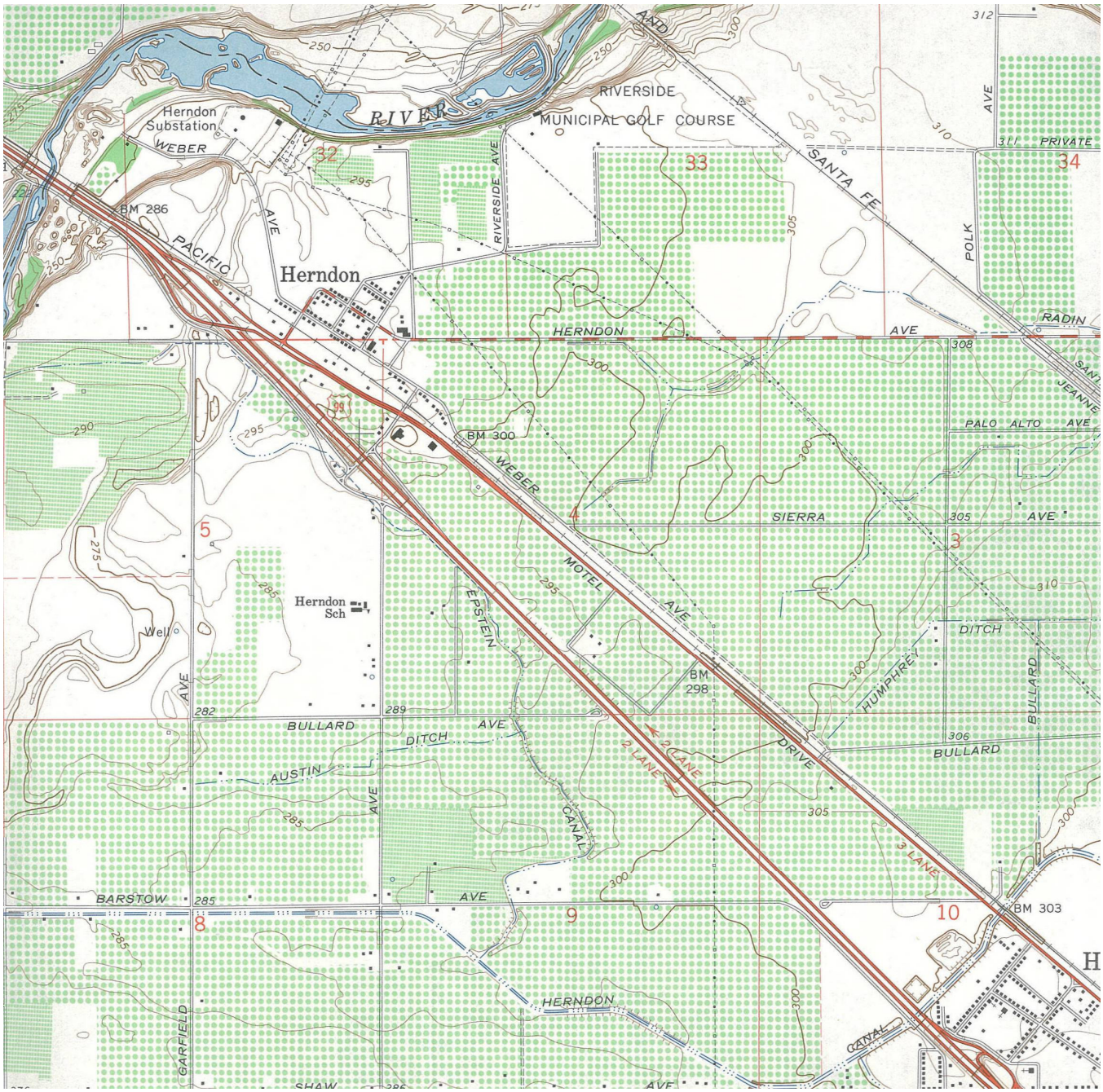
Both pipeline routes have been surveyed for archaeological resources. No archaeological resources were discovered along these routes. However, much of the pipeline routes lie along developed land, and, as a result, ground visibility was often poor.

Gas route B has not been surveyed for historic structures. However, based upon USGS *Herndon Quadrangles* from 1946 and 1964, there were no structures in this area at those times. Therefore, the existing structures are less than 45 years old and not considered historical resources. In addition, current aerial photography shows that there are no resources within fifty feet of the middle of N. Golden State Boulevard along Gas Route B. Copies of these USGS quadrangles are attached.

Gas Route C has been surveyed for historic structures. There are eight buildings standing fifty feet or less from the middle of N. Weber Avenue along Gas Route C that are 45 years old or older. DPR 523 forms for these buildings are provided in Appendix B. None appear to meet the criteria for listing in the National Register of Historic Places or California Register of Historical Resources.



1946 *Herndon* Quadrangle, showing no buildings within 50 feet of Gas Route B west of Highway 99.



1964 *Herndon* Quadrangle, showing no buildings within 50 feet of Gas Route B west of Highway 99.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 29 Rev: Please verify whether the fill source site(s) and excess material disposal areas are commercial locations. If they are not commercial locations, please conduct cultural resource pedestrian surveys, and provide reports of the dates, personnel, methods, and findings, or explain why no surveys are needed.

Response:

The preliminary grading and drainage plan provided as Figure 3.3-1 in the AFC indicates that grading of the site will require approximately 36,000 cubic yards of imported fill material. The sources of the fill material have not yet been identified, but will be permitted aggregate mining operations or recycled aggregate centers. The California Department of Conservation, Division of Mines and Geology (CDMG) identified 7 permitted aggregate mines and 4 aggregate recycling centers within the Fresno Production-Consumption Region in the update of mineral land classification for aggregate materials for the region (CDMG Open File Report 99-02 – April, 1999). The following permitted aggregate mining operations were reported within 10 miles of the BEC: Calaveras Materials, Inc.; San Joaquin Sand and Gravel Co.; Al's Concrete; and CALMAT of Central California. All four of these locations are located northeast of the site near the San Joaquin River. Aggregate is reportedly recycled by the San Joaquin Sand and Gravel Co. and by Archie Crippen Recycling about 5 miles south of the BEC.

All imported fill material will be supplied from commercial locations. No export of fill material is anticipated.

Approximately 18,000 cubic yards of asphalt and concrete construction and demolition debris will be generated during construction of the BEC. The material will be removed from the site and recycled. The County of Fresno identified 8 asphalt and concrete construction debris recycling facilities in the directory of recyclers in Fresno County (January 2005). Archie Crippen Recycling is included in the list. Mid Valley Disposal, Orange Avenue Disposal – IWS, and Waste Management also operate recycling facilities within 15 miles south and southeast of the BEC. Material that is not recyclable or has no cash value may be disposed of at permitted disposal sites. The American Avenue Disposal Site is operated by the County of Fresno approximately 25 miles southwest of the BEC.

All asphalt and concrete construction and demolition debris will be recycled at commercial locations or disposed of at permitted disposal sites.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 30 Rev: If cultural resources are identified during surveys, provide a discussion of their eligibility for inclusion in the CRHR, discuss potential construction-related impacts to the resources, and if applicable, recommend mitigation measures. Please record any discovered or newly identified cultural resources on a DPR 523 form and provide a copy of the form.

Response:

Aside from the trees mentioned in Data Request 32, JRP found seven built-environment resources during the subsequent surveys in February, 2007.

Six of these resources are residences constructed between 1940 and 1953 on Weber Ave. in the Herndon neighborhood of Fresno. One is an abandoned grocery store, built in 1940. Though all are of sufficient age to be considered historic buildings, none are associated with important events in national, state, or local history; none are associated with a person who made significant contributions to national, state, or local history; none embody characteristics of a type, period, region, or method of construction; none are the works of master builders or possessing of high artistic value; none are likely to reveal new information about historical methods of construction that are not recorded elsewhere. Therefore, none are eligible for the NRHP or are historic resources for the purposes of CEQA.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 31 Rev: Please characterize the potential for buried cultural materials in the proposed laydown area with respect to local and regional geology and soil conditions and if applicable, the types of resources that may be encountered. Within a context of local and regional geology and soil conditions, previous archaeological work conducted in the area, and past disturbances by agricultural, industrial, and residential development, please address the likelihood and types of buried cultural materials that might be encountered in project site, linear pipeline routes, and the laydown area.

Response:

The project area and all surrounding land (including the laydown area) are covered in alluvial soils dating from the Pleistocene to the Holocene. As a result, it is conceivable that buried archaeological resources may exist within the project location.

The ground surface in the laydown area indicated that vehicles have been moving over the surface for some time, and therefore, the presence of vehicles for the purposes of construction is unlikely to result in increased ground disturbance. Moreover, close examination of the ground surface revealed no evidence of archaeological resources, suggesting that near-surface resources in the area are unlikely. The lack of nearby archaeological sites or isolates, as revealed both through field survey for the Bullard Energy Center project and by a records search, suggests that the area is largely devoid of near-surface archaeological resources that would be damaged by use of this location as a laydown area.

It is suggested that the use of the laydown-area is unlikely to result in damage to any cultural resources

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 32 Rev: Please identify whether the olive trees are more than 45 years old and whether they are within 50 feet of the proposed centerline of the gas line route. If the trees are located within 50 feet of centerline of the gas line route, and if they are more than 45 years old, please conduct sufficient historic research to document whether the trees may be eligible for the CRHR.

Response:

JRP examined both the trees discussed in the data request, and also other trees that might be impacted by the proposed project. In all cases, the resources were not eligible for the NRHP or historic resources for the purposes of CEQA.

The trees in the laydown area are remnants of a fig orchard that formerly occupied nearly all of the land between N. Golden State Boulevard and N. Parkway Drive. Aerial photographs from 1950 and 1957 show this area during its fig-growing heyday. However, a 1973 aerial photograph shows that the orchard lands were beginning to be cleared for other uses. This clearing included the land just to the northwest of the laydown area and between these two roads. While these trees are almost certainly more than 45 years old, the row would only be eligible as a contributing element of a larger resource, namely, the farmstead of which they were a part. Because the farmstead is no longer in existence, the trees by themselves would not be considered an historic resource.

The trees along the northeast side of N. Golden State Boulevard and adjacent to Gas Routes B and C are within 50 feet of the centerline and may have been in place for more than 45 years. There are trees in a similar alignment along the road in aerial photographs from 1937, 1950, 1957, and 1973. Like the trees in the laydown area, they would only be eligible as a contributing element of some larger resource. Such trees are a ubiquitous feature along roads and highways throughout the state and thus are not historical resources unless evidence suggests that they were planted as a part of the road or highway's original and formal plan. Research indicates that improvements to the highway were made in the Herndon area in the mid 1920s, when the old bridge over the San Joaquin River was replaced and the road on the Fresno County side of the river straightened. Newspaper articles from the time do not mention the trees, which are located in the space between the old highway and the railroad grade; in addition, while the index to *California Highway and Public Works* has notations for articles about eucalyptus and palms being planted along highways, or heritage trees (such as oaks or redwoods) being preserved, it contains no mentions of olive trees. The aerial photographs indicate that the spacing between some trees has changed over the years; therefore, the row has lost a measure of integrity. Aerial photographs depicting the trees in 1937, 1950, 1957, and 1973 are provided below.

1937 aerial photograph showing scattered trees along northeast side of Golden State Highway.

1950 aerial photograph showing scattered trees along northeast side of Golden State Highway.

1957 aerial photograph showing scattered line of trees along the northeast side of North Golden State Boulevard.

1973 aerial photograph showing trees along the northeast side of the Golden State Highway.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 33 Rev: Please provide written assurance that staff will be provided an opportunity to conduct consultation with Native American groups and individuals prior to the signing of any binding agreements between those groups and the project applicant.

Response:

The names and contact information for all Native American contacts provided by the Native American Heritage Commission (NAHC) are included in Appendix J to the AFC (this appendix was provided to the CEC under separate cover due to confidentiality). If CEC staff require any additional information or help in contacting members of the Native American Community, Matthew Armstrong of URS will make himself available. Moreover, CEC staff will be notified should URS become in any way involved in facilitating any formal agreements between members of the Native American community and the client regarding this project.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 34 Rev: Please provide copies of any additional written responses received from Native Americans since the AFC was compiled. If responses have been received by telephone, please provide a summary of each conversation. If the location of archaeological sites may be revealed in the information, please provide the responses under confidential cover.

Response:

No such additional responses have been received. If any are, they will be forwarded to the client and the CEC staff.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 35 Rev: Please make at least one telephone call to Native American individuals or groups whose names were provided by the NAHC, if they have not responded to the applicant's requests for comments. Please provide a copy of any written responses and a summary of any telephone conversations.

Response:

As stated in the AFC, such phone calls have been made, and collectively summarized in the AFC. If the CEC requires further description of the communication with the Native American community, it can be provided.

TECHNICAL AREA: HAZARDOUS MATERIALS MANAGEMENT

Data Request 36 Rev: Please provide the number of aqueous ammonia deliveries (per month or per year) that are anticipated to occur during project operation as well as the delivery truck capacity and the anticipated delivery route.

Response:

Based on the daily aqueous ammonia consumption of 150 lbs/day, one continuous month of operation will consume up to 4,500 lbs or approximate 585 gallons (7.7 lbs per gallon) of aqueous ammonia per month.

A 10,000 gallon aqueous ammonia tank is provided onsite and based on this storage capacity and assumed daily consumption, a full delivery tank load (6,000 gallons) of aqueous ammonia is only needed every 10 months to top-off the remaining balance of 4,000 gallons onsite if aqueous ammonia is consumed continuously on a daily basis.

The anticipated delivery route is provided in the response to Data Request 58.

TECHNICAL AREA: HAZARDOUS MATERIALS MANAGEMENT

Data Request 37 Rev: Please provide the list of facilities identified and analyzed for hazardous materials cumulative impacts as indicated in section 5.15.2.4.

Response:

The only significant hazardous material that has the potential to migrate offsite from the BEC is ammonium hydroxide, NH4(OH). An Offsite Consequence Analysis (OCA) was conducted to determine the footprint of the hazard in the event of a worst-case accidental release from the ammonia storage tank. The OCA defined that a 0.1 mile circular area would be affected in the event of a worst case release scenario, in which all contents of the storage tank are accidentally released.

In an effort to determine the potential for cumulative impacts, several facilities within the 0.1 mile vulnerability zone defined by the OCA were contacted to determine their use of hazardous materials onsite. It should be noted that only facilities within this 0.1 mile zone have the potential to provide cumulative impacts from the project. However, as an added measure, additional establishments (located outside the vulnerability zone up to a 1 mile radius from the BEC site) were identified and contacted. None of the businesses identified through this investigation handle hazardous substances in quantities that would create a potential cumulative impact in combination with the BEC.

The surrounding area to the BEC consists of residential domiciles and commercial facilities. The commercial facilities found in the vicinity to the BEC consist mainly of trucking companies, automotive repair garages, and construction/painting companies. None of the facilities in the vicinity to the BEC handle hazardous substances in quantities that would create a cumulative impact with the BEC.

Facilities identified within the 0.1 mile vulnerability zone (as defined by the OCA) consist of the following:

- PRS Paintball @ 5553 W. Barstow Ave, Fresno, CA
- John R Lawson Rock & Oil @ 5829 N. Golden State Blvd., Fresno, CA
- JI Garcia Construction @ 5591 N. Golden State Blvd #101, Fresno, CA
- Allright Diversified Services, Inc. @ 5591 N. Golden State Blvd#102, Fresno, CA
- BFi @ 5501 N. Golden State Blvd., Fresno, CA
- Allied Waste: Commercial @ 5501 N. Golden State Blvd., Fresno, CA

Additional facilities found within a 1-mile radius to the BEC consist of the following:

- Art Trio Signs @ 5560 W. San Madele Ave., Fresno, CA
- Arthur's Body & Paint @ 5480 W. Mission Ave#104, Fresno, CA

- Langley Chemical Co @ 5475 W. Mission Ave., Fresno, CA
- Construction Developers Inc @ 5320 N Barcus, Fresno, CA
- Karsyn Construction @ 4933 W. Jennifer Ave., Fresno, CA
- Fimbrez Construction @ 7714 N. State St., Fresno, CA
- Cheema Carrier @ 4794 W Oswego Ave., Fresno, CA
- G & D @ 5244 W. Corona Ave., Fresno, CA
- Tyco General @ 4762 W Jennifer Ave # 106, Fresno, CA
- Apple Ridge Construction @ 4731 W Jennifer Ave., Fresno, CA
- Mark 1 Construction Management @ 4720 W. Jennifer Ave., Fresno, CA
- West Star Environmental Inc @ 4688 W Jacquelyn Ave#102, Fresno, CA
- Rgs Trucking @ 5318 N. Salinas Ave., Fresno, CA
- Jebian Construction @ 4620 W Jacquelyn Ave#108, Fresno, CA
- Kanda Inc @ 4672 W. Jennifer Ave#102, Fresno, CA
- Spadier Construction @ 6135 N. Golden State Blvd., Fresno, CA
- Central Valley Construction @ 6395 N. Garcia Ave., Fresno, CA
- Signh Trucking @ 6275 W. Bullard Ave., Fresno, CA

All these facilities were contacted to obtain information on their chemical usage and a cumulative impact report was generated based on the information received.

TECHNICAL AREA: LAND USE

Data Request 38 Rev:

a. Please provide a map showing the Prime and Unique Farmlands and Farmlands of Statewide Importance (as designated by the State of California Department of Conservation), referred to as Farmlands, that are located in the vicinity of the project site and off-site pipelines (i.e., within 0.5 miles from the center line of each pipeline right-of-way).

b. Please provide a discussion of the BEC's impact on Farmlands.

c. Please provide the GIS database spreadsheets (preferably in Microsoft Excel format) used to prepare the maps.

d. Please provide the exact acreages of Prime and Unique Farmlands and Farmlands of Statewide Importance (as designated by the State of California Department of Conservation) so that agricultural land disturbance impacts can be evaluated.

Response:

a.) Please see the attached Farmlands map provided at the end of this response.

b.) The BEC will not adversely affect the Farmlands in proximity to the project area. The project site is an existing industrial site (formerly a truck distributing center). The site is designated Industrial by the Urban Form Element of the 2025 City of Fresno General Plan, and Light Industrial by Exhibit 3, the City of Fresno Current Planned Land Use Map. The existing zoning designation is M-1, Light Manufacturing District. Therefore, no farmland will be directly disturbed by the construction or operation of the BEC. The surrounding farmland areas are in the process of being urbanized by encroaching development, predominantly residential. The linears that could potentially disturb active farmland will be buried, therefore cause no more than a very temporary disturbance.

c.) The Microsoft Excel spreadsheets used to prepare the map is provided below (the Excel file is also included on the electronic copy of this submittal)

SOIL_ABBR	FARMLAND	Acres
Ex	Farmland of Statewide Importance	14.60
Ex	Farmland of Statewide Importance	807.09
Hr	Farmland of Statewide Importance	4.11
ScA	Farmland of Statewide Importance	745.82
SeA	Farmland of Statewide Importance	2.06
SeA	Farmland of Statewide Importance	11.82
SeA	Farmland of Statewide Importance	14.65
SeA	Farmland of Statewide Importance	18.34
Es	Other	532.22
Es	Other	8.40
Es	Other	179.85
Es	Other	22.02
Et	Other	29.07
Oth	Other	1.01
Pk	Other	5.29
PmC	Other	10.52
PmC	Other	7.74
PmC	Other	6.37
PnC	Other	8.19
PnC	Other	1.82
PnC	Other	4.10
PnC	Other	0.26
SdA	Other	48.54
SdA	Other	161.46
SdA	Other	38.70
SdA	Other	0.02
SdA	Other	24.14
SdA	Other	13.96
SdA	Other	261.18
SgA	Other	24.37
SgA	Other	36.59
SgA	Other	49.38
W	Other	5.42
W	Other	1.21
W	Other	1.92
DhA	Prime Farmland if Irrigated	18.18
DhB	Prime Farmland if Irrigated	9.85
Hc	Prime Farmland if Irrigated	11.68
Hc	Prime Farmland if Irrigated	11.12
Hc	Prime Farmland if Irrigated	0.28
Hc	Prime Farmland if Irrigated	6.69
Hc	Prime Farmland if Irrigated	5.14
Hd	Prime Farmland if Irrigated	21.47
Hd	Prime Farmland if Irrigated	39.55
Hl	Prime Farmland if Irrigated	77.28
Hl	Prime Farmland if Irrigated	7.43

Hl	Prime Farmland if Irrigated	1.59
Hl	Prime Farmland if Irrigated	12.55
Hm	Prime Farmland if Irrigated	0.41
Ho	Prime Farmland if Irrigated	55.57
Ho	Prime Farmland if Irrigated	51.31
Ho	Prime Farmland if Irrigated	107.63
Hst	Prime Farmland if Irrigated	60.21
Hst	Prime Farmland if Irrigated	18.92

d.) The acreages of Prime and Unique Farmlands and Farmlands of Statewide Importance (as designated by the State of California Department of Conservation) are included in the table in response to DR 38(c), above.

Farmlands Map (11x17) Placeholder

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 39 Rev: Please provide a draft DESCP containing elements A through I below outlining site management activities and erosion/sediment control Best Management Practices (BMPs) to be implemented during site mobilization, excavation, demolition, construction, operation and closure. The level of detail in the draft DESCP should be commensurate with the current level of planning for site grading and drainage. Please provide all conceptual erosion control information for those phases of construction and post-construction that have been developed or provide a statement when such information will be available.

A. **Vicinity Map –** A map(s) at a minimum scale 1"=100' will be provided indicating the location of all project elements (construction site, laydown area, pipelines, etc.) with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

B. **Site Delineation –** All areas subject to soil disturbance for the BEC (project site, laydown area, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing boundary lines of all construction/demolition areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

C. **Watercourses and Critical Areas –** The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. Indicate the proximity of those features to the BEC construction, laydown, and landscape areas and all transmission and pipeline construction corridors.

D. **Drainage Map –** The DESCP shall provide a topographic site map(s) at a minimum scale 1"=100' showing all existing, interim and proposed drainage systems and drainage area boundaries. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours shall be extended off-site for a minimum distance of 100 feet in flat terrain.

E. **Drainage of Project Site Narrative –** The DESCP shall include a narrative of the drainage measures to be taken to protect the site and downstream facilities. The narrative should include the summary pages from the hydraulic analysis prepared by a professional engineer/erosion control specialist. The narrative shall state the watershed size(s) in

acres that was used in the calculation of drainage measures. The hydraulic analysis should be used to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the BEC construction and laydown areas.

F. **Clearing and Grading Plans –** The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography.

G. **Clearing and Grading Narrative –** The DESCP shall include a table with the quantities of material excavated or filled for the site and all project elements of the BEC project (project site, lay down area, transmission corridors, and pipeline corridors) whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported.

H. **Best Management Practices Plan –** The DESCP shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction (initial grading/demolition, project element excavation and construction, and final grading/stabilization). BMPs shall include measures designed to prevent wind and water erosion.

I. **Best Management Practices Narrative –** The DESCP shall show the location (as identified in H above), timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading, during all project element (site, pipelines, etc.) excavations and construction, final grading/stabilization, and post-construction. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule should include post-construction maintenance of structural control BMPs, or a statement provided when such information will be available.

Response:

A Draft DESCP containing elements A through I including site management activities and erosion/sediment control Best Management Practices (BMPs) to be implemented during site mobilization, excavation, demolition, construction, operation and closure has been prepared and attached in Appendix C.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 40 Rev: In Section E of the DESCP, please provide a clear description of topographic conditions at the project site and verify that the topographic map of existing conditions submitted with the DESCP is accurate.

Response:

A draft DESCP has been prepared and is attached in Appendix C. The draft DESCP includes a description of the topographic conditions of the proposed project site. Refer to Section 2.0, Drainage, of the draft DESCP.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 41 Rev: In Section E of the DESCP, please verify whether the entire project site will be re-graded. If the site will not be entirely re-graded, please indicate on the proposed-drainage map in Section D of the DESCP the portions of the site that will not be re-graded.

Response:

A draft DESCP has been prepared and is attached in Appendix C. The entire proposed BEC project site will be re-graded, except for the existing administration building located on the east side of the site, which will remain in-tact.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 42 Rev: In Section E of the DESCP,, please provide a clear description of the non-industrial portion of the site, which will not drain to the retention basin, and a clear description of the industrial portion of the site; include a description of the acreage for each portion and a description of all drainage improvements for each area. In Section D of the DESCP, please delineate these two areas on the proposed-drainage map and show all drainage improvements.

Response:

The non-industrial portion of the site includes the employee parking areas, switchyards, administration building, and open space areas. The DESCP will be updated and revised to include acreages and drainage improvements for the industrial and non-industrial portions of the site, as the project progresses from the preliminary to the final design and construction phases. Refer to the draft DESCP attached in Appendix C.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 43 Rev: AFC Figure 3.3-1 shows an "outlet pipe" near the basin but does not indicate where or how basin overflow will discharge offsite. In Section D of the DESCP, clearly indicate on the proposed-drainage DESCP map all drainage features associated with the retention basin, including structural controls and discharge point for off-site stormwater discharge from the retention basin. In Section E of the DESCP, please provide a description of the amount of water that would discharge off the site from the basin during the 100-year storm event, including the percentage of stormwater from the site and the total volume of water.

Response:

The draft DESCP includes project details commensurate with the current level of planning available for site grading and drainage. As information becomes available and as the proposed project proceeds from the preliminary to final design and construction phases, the DESCP will be updated and revised to reflect the progress of the project. In addition, refer to Section 2.0, Drainage, of the draft DESCP.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 44 Rev: In Section H and Section I of the DESCP, please describe how potential toxic contaminants in soil and stormwater will be managed to insure they are properly controlled and disposed.

Response:

The runoff at the site will be conveyed to an infiltration basin capable of containing runoff from a 100 yr flood event. Much of the site is currently paved, limiting the areas where soils will be exposed. In addition, much of the BEC will be capped by paving or covered by buildings/equipment, and most of the remainder will be covered in crushed rock several inches thick.

Based on the findings of a Phase I Environmental Site Assessment, it is unlikely that contaminated soil will be encountered during construction (see Appendix T of the AFC). A Phase II Environmental Site Assessment including a geophysical survey and collection of surface and subsurface soil samples will be conducted at the site to locate potential toxic contaminants prior to construction. In addition, operators and construction personnel will be asked to report unusual conditions to the appropriate personnel and the area and / or material will be properly contained during investigative actions. Soils that appear to contain potential toxic contaminants will be stockpiled. Stockpiles will be covered with plastic sheeting or tarps that are secured safely with sand bags and bermed with hay bales or silt fencing to prevent runoff from leaving the area. If required, samples will be collected and submitted to a certified analytical laboratory for characterization. If contamination is detected, the waste will be properly handled and disposed of off site in an authorized waste management facility.

Storm water runoff could be generated at the site during construction or operation. BEC will obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ) for construction activities at the site. Storm water runoff during construction will be managed in accordance with a storm water pollution prevention plan (SWPPP). The SWPPP will contain a site map which shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP will list Best Management Practices (BMPs) that will be used to protect storm water runoff and the placement of the BMPs. In addition to diversion of runoff to the infiltration basin, the SWPPP will identify use of source control BMPs such as stabilized construction entrances, silt fencing, berms, hay bales, and infiltration basins to control runoff from all construction areas as appropriate. The SWPPP will also contain a visual monitoring program and a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs.

Following construction of the BEC, potential toxic contaminants in soil will be primarily be covered by paved roads, paved parking areas, and graveled areas. Buildings, equipment or other facilities will also effectively cap any existing contaminated soil not removed during construction. During operation, stormwater will be routed through culverts and swales to an infiltration basin located near the west portion of the BEC site. The infiltration basin will be sized according to federal, state and local guidelines. The infiltration basin and outlet structure will be capable of attenuating the peak discharge of the 100-yr 24-hr storm event to pre-development conditions. Runoff from the infiltration basin will discharge to a ditch on the north side of the plant adjacent to the access road. Stormwater entering the property from off-site will be diverted away from the plant area using ditches adjacent to the north and south access roads. The grading and drainage facilities

will be designed consistent with the "Stormwater Best Management Practice Handbook – Industrial and Commercial" published by the California Stormwater Quality Association BMP to reduce erosion and remove silt.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 45 Rev: Please clarify whether or not the project proposes to obtain a NPDES permit for industrial activity. If not, please provide a detailed explanation why the project should be exempt from this requirement and confirmation from the Central Valley RWQCB.

Response:

As described in the AFC (section 5.5.3.3, page 5.5-26) the project will discharge industrial process wastewater to the FCWTP. A "Will-Serve" letter has been received from the City of Fresno stating that the sanitary sewer and WWTP can accept this waste. Therefore, no NPDES permit will be required for discharge of industrial wastewater from the BEC. In addition, all runoff from areas of the BEC site containing industrial activities or materials will drain to an infiltration basin. As this basin has been sized to contain all runoff from the industrial areas of the BEC that may result from storm events with recurrence intervals of as little as 100 years and the BEC will only be permitted for 20 years, there is effectively no discharge to permit. Further, the BEC will be designed such that there will be no exposure of significant materials to storm water. Therefore, BEC does not intend to seek coverage under the General Industrial Stormwater Permit. However, in developing this response BEC was unable to make contact with the Supervisor of the Stormwater Unit at the Central Valley Regional Water Quality Control Board (Dale Harvey, 559.445.5116). In the event that the Central Valley Regional Water Quality Control Board determines that coverage is needed despite the containment of stormwater runoff and no exposure design features, BEC will apply for coverage under the General Industrial Stormwater Permit and implement the compliance requirements of this permit including preparation of a Stormwater Pollution Prevention Plan and Monitoring Plan.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 46 Rev: Please provide an update on the proposed water supply offset plan for both groundwater recharge and nitrate treatment.

Response:

EIF has initiated discussions with the City, Fresno Irrigation District and the Fresno Flood Control and Water Conservation District to identify opportunities to provide additional recharge capacity sufficient to offset the use of groundwater by the BEC. Although the sites discussed to date are in the general vicinity of the BEC in the northwest area of Fresno, these discussions are preliminary and site selection criteria will need to be developed. In consultation with the City of Fresno, EIF has also identified potential well sites in the southeastern portion of Fresno and technologies for nitrate removal. At this time it appears that the most appropriate technology for this application may be nitrate removal through selective ion exchange. When finalized by EIF, the information on candidate wells and treatment technology will be presented to the City and reviewed to coordinate with the City's water supply needs. It is anticipated that agreements to implement both of these water supply offsets will be completed this summer.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 47 Rev: The AFC includes economic analyses of the relative costs for most of the water supply/cooling alternatives and wastewater disposal alternatives. Each alternative that is analyzed was assigned a low, medium or high rating for both operation and maintenance costs and capital costs. Please provide an estimated dollar-amount cost for implementing the following alternatives:

Water Supply

a. Dry cooling

b. Herndon Canal water

c. Municipal water supply

d. Reclaimed water

Wastewater Disposal

e. Zero liquid discharge

f. Evaporation pond

g. Deep injection well

h. Wastewater treatment plant

i. Off-site treatment facility

Response:

Water Supply

a. **Dry cooling -** The power purchase agreement with Pacific Gas & Electric (PG&E) calls for delivery of 200 MW to the electric grid. PEC considered the use of dry cooling to minimize water use. This option is not efficient when called to meet peak load demands at higher ambient temperatures. Reliance on dry-cooling would not support maximum power

generation when power is most critical to the citizens of Fresno area and California. This is a critical consideration as the BEC will primarily be needed during the warmest ambient conditions.

The LMS100's unique design utilizes an intercooler for the inlet air as it is compressed, allowing for approximately 10% greater thermal efficiency than existing commercial simple cycle peaking units. This design also requires an efficient methodology to reject the intercooled air heat under these difficult peak ambient conditions.

Power output decreases up to 25MW per unit with dry cooling under these conditions. This would require the installation of a 3rd LMS100 to achieve the 200MW contractual requirement. Use of dry cooling would result in a significant decrease in thermal efficiency; increase in fuel burned and increased air pollutant emissions. The use of dry cooling would negate the efficiency advantage of the LMS100 design at this site. It is estimated that installation of dry cooling technology at the BEC would cost approximately $35 million.

Dry low NOx burner alternative

PEC recommends the use of water injection for NOx control. GE currently does not have a commercial offering of dry low NOx burners for the LMS100. There is not alternate equipment that will allow PEC to satisfy its obligations under the PG&E contract

b. **Herndon Canal water –** It is not possible to cost-out this alternative. As described in section 5.5.2.1 (p. 5.5-9) of the AFC, this supply is not feasibly available on a sufficiently constant and reliable basis for use by the BEC. As the Herndon Canal is not a feasibly available supply of water to the BEC, a cost estimate is of no consequence.

c. **Municipal water supply –** The cost of municipal water supply will be negotiated as part of the groundwater offset package with the City.

d. **Reclaimed water –** As noted in section 5.5.2.1 (p. 5.5-11) of the AFC, reclaimed wastewater is not feasibly available to the BEC due to the distance of the Fresno-Clovis Regional Water Reclamation Facility. This is due to the capital cost of pipeline and pumping facilities (estimated at approximately $10 million) and the ongoing cost of pumping the wastewater uphill to the BEC. As this source was determined to be infeasible at this time, a more detailed economic analysis was not conducted.

Wastewater Disposal

e. **Zero liquid discharge –** Implementation of a zero liquid discharge (ZLD) wastewater disposal system at the BEC would require pre-treating the process wastewater to remove the mineral content and recirculate the resulting liquid back into the process. For the BEC project, it would be necessary to size the ZLD system to treat the maximum daily wastewater production anticipated (521,000 gallons per day) and assumes that all plant wastewater, except sanitary wastewater and discharge from the oil/water separators, is routed to the cooling tower. The latter wastewater streams are assumed to be disposed of to the sanitary sewer and land disposal respectively.

The ZLD design concept is comprised of two major subsystems:

- Cooling Tower Blowdown Pretreatment and Concentration
- Brine Crystallization and Solids Handling

The cooling tower blowdown and concentration subsystem would include a High Efficiency Reverse Osmosis (HEROTM) system for volume reduction. This process requires extensive pretreatment to remove suspended solids, hardness, alkalinity and silica. The first step of the process treatment is lime and soda ash softening of a sidestream of the circulating water. The lime and soda ash softener is unsuitable for start-stop operation. Therefore a 1,000,000 gallon capacity cooling tower blowdown storage tank would be required to allow the lime and soda ash softening process to continue operating at steady state even when the plant is not operating. In the event tank contents is depleted during a plant outage, the lime and soda ash softening process is shut down and will require 1 to 2 days for an orderly restart.

Approximately 300 gpm of the softened water from the side stream lime and soda ash softening process would be further treated by the HERO system. The HERO system should be able to recover approximately 90% of this waste stream with the reject steam going to the Brine Crystallization and Solids Handling Subsystem.

The Brine Crystallization and Solids Handling subsystem was assumed to be ~ 30 gpm based on continuous operation and 90% recovery by the HERO process. Distillate from the crystallizer would be returned to the cooling tower. A portion of the recirculating slurry of salt crystals would be sent to the filter press for dewatering. Filtrate from the filter press would be returned to the crystallizer. The salt cake would be dumped into a hopper for off-site disposal via a truck transporter. This evaluation has not estimated the number of trucks per day or a location for disposal.

The ZLD system is complex and labor intensive as it requires continuous operator attention while in service. It is estimated that BEC would need to double its proposed staff from 12 to 24 personnel to be able to operate and maintain the ZLD system.

The lime softening, HERO and ZLD systems are designed to operate continuously and require approximately 24 hours to start up. This is incompatible with the BEC plant design and PG&E requirements that the plant be up to full load in 10 minutes. Keeping the ZLD system operational at all times, even when the power plant is not operational, would make the BEC economically infeasible.

The lime softening system includes environmental impacts related to the transport, delivery and storage of bulk quantities of lime and soda ash as well as the unloading, transport and delivery (to landfill) of sludge. Further, the lime softening pretreatment system would cost approximately $16M initially (capital Costs) as well added costs of about $2M per year for operations and maintenance. The PEC cannot sustain these added costs and remain economically viable under the pricing model that was used to win the PG&E supply bid.

In summary the ZLD system is not appropriate for the BEC project for the following reasons as it would:

- Impact the economic feasibility of the BEC by increasing the capital costs by about $16 million and annual operating costs by about $2 million

- Limits the ability of the BEC to meet contractual requirements of the PPA and customer (PG&E) needs by limiting plant readiness on demand.

- Adds to environmental issues due to increase in truck traffic and handling of additional chemicals and sludge hauling to a landfill.

As described in section 5.5.2.2 (p. 5.5-15) of the AFC, this method of wastewater disposal was determined to be not feasible.

f. **Evaporation pond –** As noted in Table 5.5-3 of the AFC (p. 5.5-8), the estimated average wastewater flow from the BEC will be 431,000 gallons per day. Discharge of the full waste stream would require a lined pond in excess of 110 acres, with a construction cost of over $33M. Based on current land values in the vicinity of the BEC of approximately $160,000 per acre, land acquisition costs would exceed $17.5 million. As described in section 5.5.2.2 (p. 5.5-15) of the AFC, there is insufficient area at the BEC site for construction of an evaporation pond and this alternative may result in significant environmental impacts. Therefore, an economic analysis was not performed.

g. **Deep injection well –** As described in section 5.5.2.2 (p. 5.5-16) of the AFC, construction of a deep injection well is not feasible because a suitable hydro-geologic formation for injection is not available at the BEC site. Since a deep injection well is not physically workable in the vicinity of the BEC, an economic analysis was not performed.

h. **Wastewater treatment plant –** As described in section 5.5.2.2 (p. 5-.5-16) of the AFC, a "Will-Serve" letter has been received from the City of Fresno stating that the sanitary sewer and WWTP can accept this waste. However, rates for disposal of the wastewater have not been negotiated with the City.

i. **Off-site treatment facility –** As described in the AFC (Table 5.5-3, p. 5.5-8), it is estimated that the BEC will produce an average 431,000 gallons of wastewater daily. Assuming that 10,000 gallon capacity tanker trucks were used, offsite disposal would require 431 trucks per day to remove the wastewater from the BEC. Further, a feasibly accessible facility has not been located and it is unlikely that such a facility can be identified for disposal of the full volume of wastewater. As the distance to a disposal facility and the cost of disposal at such a facility could not be identified, it is not practicable to develop a cost estimate for this wastewater disposal alternative.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 48 Rev: The discussion of reclaimed water indicates that reclaimed water is available from the Fresno-Clovis Regional Water Reclamation Facility (FCRWRF) but is not the preferred alternative because of costs.

a. Please clarify whether or not the project could purchase reclaimed water from the FCRWRF.

b. Table 5.5-6 indicates that use of reclaimed water would not satisfy LORS. However, the AFC does not explain this conclusion. Please explain why use of reclaimed water would not satisfy LORS.

c. Table 5.5-6 also indicates that use of reclaimed water would be technologically infeasible, but the discussion on page 5.5-12 states that use of reclaimed water will be reconsidered if it becomes "available." Please clarify why the use of reclaimed is currently technologically infeasible.

Response:

a. The project could purchase reclaimed water from the FCRWRF. However, as described in the response to DR 47(d), this source is not feasibly available to the BEC at this time due to distance and the capital cost of pipeline and pumping facilities (estimated at approximately $10 million) and the operational cost of pumping the wastewater uphill to the BEC.

b. As described in the AFC (Table 5.5-5, p. 5.5-12), the reclaimed water from the FCWRF exhibits levels of total dissolved solids (TDS) of 510 mg/L, 2½ times greater than the municipal supply of 205 mg/L. Use of reclaimed water in the cooling tower will further increase the TDS concentration in the wastewater to levels that would exceed the electrical conductivity limits acceptable by the FCWRF. As there is no feasible alternative to disposal of wastewater at the FCWRF, use of reclaimed water at the BEC is not feasible.

c. See responses to DR 47(d) and DR 48(b). Discussion on AFC page 5.5-12 indicates that, although use of reclaimed wastewater is not feasible at this time, BEC is open to considering use should it become available. However, identification of technically and economically feasible methods of wastewater disposal will need to be developed prior to use for facility supply. At this time use of reclaimed water at the BEC may be limited to landscape irrigation, toilet flushing and other incidental uses.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 49 Rev: The discussion of agricultural wastewater on page 5.5-12 states that the quantity of water that is available is insufficient and that water quality is too variable to be useable.

a. Please describe the water quality conditions and the technologically feasibility of using agricultural wastewater.

b. Identify the location of the agricultural wastewater source that was evaluated and the volumes of water available on a monthly or seasonal basis from this source.

c. Identify the location of agricultural wastewater source nearest to the project that would have sufficient flows to supply the project.

d. Provide an estimated dollar-amount cost for using agricultural wastewater from the nearest reliable source.

Response:

The non-availability of a source of agricultural wastewater was understated on page 5.5-12 of the AFC. There is little irrigated agriculture within several miles of the BEC site. Where irrigation does occur, such irrigation is performed on few occasions during the winter. Areas that are currently in agricultural land use to the west of the BEC site are planned for development during the life of the project. There are no perennially flowing agricultural drains in the general area of the project, much less agricultural wastewater drains that contain sufficient flows to supply the project. As agricultural wastewater is not available, no samples have been collected, sources identified or cost-estimates developed.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 50 Rev: The discussion of use of groundwater from the upper aquifer on page 5.5-13 states that "the City of Fresno prohibits the construction of groundwater supply wells outside of those for its own production." Please identify the City of Fresno ordinance or regulation that prohibits private supply wells in the upper aquifer.

Response:

The differentiation between "upper groundwater" and "lower groundwater" on page 5.5-13 of the AFC is based on groundwater quality rather than aquifer properties. Both of these groundwater bodies are contained within a single unconfined to semi-confined aquifer underlying the BEC site.

The Municipal Code of the City of Fresno, Chapter 9, Article 6, Section 602 "Well Drilling Prohibition" states the following:

(a) The drilling or digging of wells within the city, except by the City of Fresno, for any other purpose than for furnishing water in whole or in part for refrigeration, air conditioning, or for the purpose of furnishing water to any refrigeration or air-cooling system or unit, or for a drainage well in connection therewith, or for irrigation, or use as a monitoring well, is hereby prohibited; provided that the Public Works Director may issue a permit for the drilling and completion of a well pursuant to the following requirements.

(b) The Director may issue a permit for the drilling of a supply well for domestic, commercial or industrial purposes for temporary use only, under the following conditions:

> *(1) City water mains are not in place adjacent to the property involved.*
> *(2) The Director has determined that it is not economically feasible or desirable to extend the city's water mains to serve the property at the time the request for service is made by the owner or lessee.*
> *(3) The owner or lessee of the property has executed an agreement for the discontinuance of the use of the well and the capping of the same upon notice by the Director. Such notice shall be given immediately following installation of water mains adjacent to the property on which the well has been drilled.*

(c) The Director may issue a permit for the drilling of a supply well to replace an existing well or to deepen an existing well supplying water for industrial food or beverage processing, or for irrigation of cemeteries providing that cemeteries are in compliance with the other provisions of this Code, when in the determination of the Director, the existing well which heretofore has served such purposes has become impaired and unusable, providing such well shall be permanently capped and closed.

(d) The Director may issue a permit for drilling of a new supply well for industrial food or beverage processing purposes, when in the determination of the Director the use of such well would significantly lessen the amount of the energy that would otherwise be consumed by the food or beverage processing operation.

(e) Issuance of a permit pursuant to subsections (b), (c) or (d) of this section shall in no way nullify or affect any provisions of Chapter 14 of this Code or amendments thereto, which provide for the installation of water mains and the payment therefrom.

(f) Any permit issued for the digging of a well for irrigation or food or beverage processing purposes shall be conditioned upon the installation of a water meter on such well at the permittee's expense and the payment by the user at the rate specified in Section 14-105 of this Code for all water drawn therefrom.
(g) The Director may issue a permit for the drilling of a monitoring well within a public right-of-way following satisfaction of the following requirements:

> *(1) Completion of an Environmental Assessment.*
> *(2) Issuance of a Street Work Permit, in accordance with Sections 11-202, 11-203 and 11-204.*
> *(3) Execution of an agreement providing indemnification for the city, protection of the public right-of-way, discontinuance of the use of the well and abandonment of the well upon notice by the Director. Such notice may be given for any reason at the Director's sole discretion. The Director is authorized to execute the required agreement on behalf of the City. (Orig. Ord. 4553; Am. Ord. 5309, 1964; Am. Ord. 73-120, § 7, eff. 8-16-73; Am. Ord. 80-115, § 107, eff. 8-8-80; Am. Ord. 81-83, § 1, eff. 8-7-81; Am.Ord. 86-22, § 3, eff. 3-22-85; Am. Ord. 90-127, §§ 2, 3, eff. 12-14-80).*

Process and potable water usage at the BEC are not listed as uses exempt from Fresno Municipal Code 9-602. Exempt uses include refrigeration or air-cooling system supply or drainage wells, irrigation wells, monitoring wells, replacement supply wells, and industrial food or beverage processing supply wells under certain conditions. The Fresno Public Works Director may issue a permit for the drilling of a supply well for domestic, commercial or industrial purposes for temporary use if city water mains are not in place adjacent to the property involved, or if it is not economically feasible or desirable to extend city water mains at the time a request for service is made. However, a city water main is already adjacent to the BEC site and the city is committed to provide water to the project (see AFC Appendix U).

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 51 Rev: The discussion of use of groundwater from the lower aquifer on page 5.5-13 states that the City of Fresno opposes the construction of new groundwater wells. Please identify the City of Fresno ordinance or regulation that prohibits private supply wells in the lower aquifer.

Response:

See response to Data Request 50. The Municipal Code of the City of Fresno, Chapter 9, Article 6, Section 602 "Well Drilling Prohibition" does not differentiate between completion of wells within the upper and lower portions of the aquifer.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 52 Rev:

a. Table 5.5-7 indicates that use of evaporation ponds for wastewater disposal would not satisfy LORS. The AFC does not explain this conclusion. Please explain why use of evaporation ponds for wastewater disposal would not satisfy LORS.

b. The discussion of the use of evaporation ponds on page 5.5-15 states that the BEC site lacks sufficient space to construct evaporation ponds. Please identify how much land would be required to construct evaporation ponds.

c. Table 5.5-7 indicates that evaporation ponds would require high capital costs. Does this estimate include the cost of purchasing additional land for the ponds? If not, include this cost when providing an estimated dollar-amount cost for implementing evaporation ponds (Data Request 49f).

Response:

a. As described in Table 5.5-8 (p. 5.5-18), the water supply contains an elevated concentration of silica of approximately 62 mg/L. As reflected in Table 5.5-13 (p. 5.5-28), use of this supply by the BEC is estimated to result in silica concentrations in the wastewater of approximately 150 mg/L. As additional concentration of this wastewater in an a evaporation pond may result in silica concentrations toxic to wildlife, it is anticipated that the Regional Water Quality Control Board may not issue Waste Discharge Requirements for the construction and operation of an evaporation pond.

b. As noted in Table 5.5-3 of the AFC (p. 5.5-8), the estimated average wastewater flow from the BEC will be 431,000 gallons per day. Discharge of the full waste stream would require a lined pond in excess of 110 acres, with a construction cost of over $33M. Based on current land values in the vicinity of the BEC of approximately $160,000 per acre, land acquisition costs would exceed $17.5 million.

c. As noted in Table 5.5-3 of the AFC (p. 5.5-8), the estimated average wastewater flow from the BEC will be 431,000 gallons per day. Discharge of the full waste stream would require a lined pond in excess of 110 acres, with a construction cost of over $33M. Based on current land values in the vicinity of the BEC of approximately $160,000 per acre, land acquisition costs would exceed $17.5 million.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 53 Rev: The AFC discusses the use of a deep injection well as an alternative for the disposal of wastewater. Page 5.5-16 states that the applicant determined that the BEC site would not meet installation requirements based on geophysical well logs.

a. Please provide copies of the well logs (and the well locations) that were used to analyze conditions at the project site.

b. Describe the specific conditions and identify the evidence in the well logs that supports the conclusion that site conditions do not meet injection well requirements.

Response:

The proximity of various exploration or "wildcat" wells to the BEC was evaluated using California Department of Oil, Gas and Geothermal Resources (DOGGR) Map W5-2 and Map W-34 in the 1994 edition of the Munger Map Book of California and Alaska Oil and Gas Fields. The closest exploration well to the BEC shown on these maps is identified as the Arco Oil and Gas Company KCL Munier No. 1 and as the Tenneco KCL (number 67-3692), respectively. The well was located 2,310 feet south and 1,650 feet west of the northeast corner of Section 2 of Township 13 south and Range 19 east of the Mount Diablo baseline and meridian which is approximately 7,000 feet northeast of the BEC. The location of the plugged and abandoned dry hole is indicated on the Site Geologic Map provided in the AFC as Figures 5.3-2A and 5.3-2B. An induction electrical log for the well is provided as Appendix E.

The following geologic conditions protective of an underground source of drinking water (USDW) are required to obtain a Class I Underground Injection Control Permit from the US Environmental Protection Agency:

- A thick sequence of low permeability sediments that would confine the injected wastewater, and prevent migration toward an USDW,
- A thick sequence of permeable sediments capable of accepting the injected wastewater underlying the low permeability sediments, and
- The injection operation should not facilitate the fracturing of the rocks or the integrity of the injection well.

The induction electrical log for KCL Munier No. 1 was interpreted to estimate the depth and thickness of geologic units that would serve as confining and injection zones for potential wastewater injection wells installed at the BEC. Geologic conditions underlying the BEC are expected to be similar to those encountered at the KCL Munier No. 1 location. In general, depths and thicknesses of the geologic units are expected to be greater due to the thickening of sediments toward the basin axis located to the west. These changes are considered negligible over the distance separating the two sites.

An interval of low resistivity as ohms – square meters per meter shown on the log at depths of approximately 2,060 to 2,270 feet below the Kelly bushing (about 9 feet above ground surface) is interpreted to represent the Kreyenhagen Formation. The Kreyenhagen Formation is aerially extensive, was deposited during the middle to late Eocene (about 40 to 50 million years before present), and is predominantly low permeability shale. The Kreyenhagen Shale is considered to be a suitable confining zone for injection wells and has been approved by the US EPA as such in the past (e.g., Hilmar Cheese and California Specialty Cheese Class I non-hazardous injection well permits). However, because the base of fresh groundwater within an USDW is estimated to be within about 700 feet of the top of the 210-foot thick potential confining zone, it is unlikely that the US EPA would permit injection wells at the site. The City of Fresno pumps groundwater for municipal supply and the base of fresh groundwater is estimated to be as deep as 1,360 feet below ground surface at the BEC.

Permeable sediments capable of accepting injected wastewater appear to be relatively thin below the Kreyenhagen Shale based on the log. Positive increases in resistivity and conductivity as millimhos per meter shown at depths ranging from approximately 2,270 to 2,300, 2,320 to 2,350, and 2,640 to 2,690 feet below the Kelly bushing indicate that relatively high permeability sediments are present in these zones. These zones are interpreted to be sandstones that would be the most successful injection zones for potential injection wells at the BEC. However, the three zones are only about 30 to 50 feet thick which would likely require unacceptably high pressures for injection of the volume of wastewater expected to be generated by the BEC.

Injection pressures required to dispose of wastewater using an injection well were not quantified because the proximity of fresh groundwater to the proposed confining layer and the relatively thin confining and injection zones do not appear to be suitable for injection wells at the BEC.

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 54 Rev: Will any deliveries be made to the site (during construction or operation) by rail? If so, how would they be offloaded and delivered to the site?

Response:

No. There is no plan to use rail transportation during either construction or operation of the project.

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 55 Rev: Please provide accident history for the following intersections:

a. Hwy 99 Southbound Off-Ramp / West Herndon Ave.

b. Hwy 99 Northbound Off-Ramp / West Herndon Ave.

c. Grantland Ave. / Parkway Drive

d. Hwy 99 Southbound Off-Ramp / Shaw Ave.

e. Hwy 99 Northbound On-Ramp / Shaw Ave.

f. North Golden State Boulevard / West Herndon Ave.

g. North Golden State Boulevard / Carnegie Ave.

h. North Golden State Boulevard / Shaw Ave.

Response:

a. Hwy 99 Southbound Off-Ramp / West Herndon Ave. 4 accidents reported in 36 months (Source Caltrans)

b. Hwy 99 Northbound Off-Ramp / West Herndon Ave. 9 accidents reported in 36 months (Source Caltrans)

c. Grantland Ave. / Parkway Drive. None reported (Source City of Fresno)

d. Hwy 99 Southbound Off-Ramp / Shaw Ave. 5 accidents reported in 36 months (Source Caltrans)

e. Hwy 99 Northbound On-Ramp / Shaw Ave. 11 accidents reported in 36 months (Source Caltrans)

f. North Golden State Boulevard / West Herndon Ave. 8 accidents reported from 2002 to 2005 (Source City of Fresno)

g. North Golden State Boulevard / Carnegie Ave. 1 accident reported in 2005 (Source City of Fresno)

h. North Golden State Boulevard / Shaw Ave. 30 accidents reported from 2002 to 2006 (Source City of Fresno)

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 56 Rev: Please provide flight patterns for Sierra Sky Park airport.

Response:

Based on the runway orientation and airfield layout, the flight patterns follow a northwest trending direction for both takeoffs and landings.

Airport operations contact is Mr. Walt Kless (559)-706-8941, president of the airport association.

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 57 Rev: Please verify whether CHP aircraft fly over Hwy 99 in the vicinity of the project site; and if so, identify any issues of concern from the CHP.

Response:

According to Sgt. Donald Jennings (Badge No. 14030) with the CHP Air Operations Unit, the CHP's position finds that the proposed project (with 90 foot high stacks) will not interfere with CHP operational activities.

CHP Contact: Sgt. Jennings, Sgt. Bickford, CHP Air Ops, 559-488-4121

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 58 Rev: Please describe the proposed truck route for hazardous material deliveries and provide a detailed map of the hazardous material route from the appropriate freeway exit to the facility. For the truck route, please discuss:

- any road hazards such as railroad crossings, sharp curves, and intersections without traffic control such as signals, yield or stop signs, etc;
- the land uses along the route; and
- the location of any sensitive receptors along the route such as schools, hospitals, commercial or housing development, etc., affected by hazardous material deliveries.

Response:

a – Based on the traffic field reconnaissance survey, there are no road hazards identified to and from SR-99, the Shaw Avenue interchange, along Golden State Boulevard and the project site. See detailed map provided on the following page.

b – The land uses along the route are predominantly industrial uses and some commercial use. One residence is located approximately 750 feet southeast of the project boundary.

c – There are no sensitive receptors identified in close proximity to the BEC that could be affected by hazardous material deliveries. The nearest sensitive receptor is a residence approximately 750 feet southeast of the project boundary. See AFC Section 5.16, Public Health, for additional information on sensitive receptors.

Proposed Truck Route for Hazardous Materials Deliveries

Bullard Energy Center

URS FIGURE DATA REQUEST 58

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 59 Rev: Please provide an estimate of the number and type of hazardous materials deliveries each month including the expected quantity of each delivery.

Response:

The majority of hazardous materials are delivered on "as needed" basis during normal plant operating conditions Based on the daily aqueous ammonia consumption of 150 lbs/day (see Application For Certification Bullard Energy Center, Llc Fresno, California, Section Five, 5.15 Hazmat Handling, Table 5.15-2 Hazardous Materials And Waste Usage And Storage During Operations)

One continuous month of operation will consume up to 4,500 lbs or approximate 585 gallons (7.7 lbs per gallon) of aqueous ammonia per month.

A 10,000 gallon aqueous ammonia tank is provided onsite and based on this storage capacity and assumed daily consumption, one (1) full delivery tank load (6,000 gallons) of aqueous ammonia is needed every 10 months to top-off the remaining balance of 4,000 gallons onsite if aqueous ammonia is consumed continuously on a daily basis.

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 60 Rev: For the proposed pipeline routes, please provide:

a. the current level of service (LOS) for roadways that the pipelines will follow,

b. the location of the pipeline within the roadway and the area required for the trenching operation,

c. the number of traffic lanes to be closed, and timing of the closure,

d. the impact of lane closure on traffic flow,

e. the amount of roadway under construction at any one time, and

f. the duration of pipeline construction and installation activities.

g. The mitigation measures proposed to minimize impacts to traffic and any homes or businesses that will be affected.

Response:

Based on the information provided in Section 3.7, the project includes: (1) an underground natural gas supply pipeline, (2) an underground water supply pipeline, and (3) an underground sewer pipeline.

Natural Gas Pipeline – The project will connect to a PG&E trunk line approximately 9,500 feet west of the site, near the intersection of North Garfield Avenue and West Bullard Avenue. The primary pipeline route will convey gas via a pipeline up to 12 inches in diameter along West Bullard Avenue to North Golden State Boulevard, and then south to the site. Two alternate routes include the same PG&E connection location, continuing north along North Garfield Avenue to Herndon Avenue, then south along North Golden State Boulevard and North Weber Street to the site.

Water Supply Line – A Fresno city water main located near the southeast corner of the site along North Golden State Boulevard will be extended approximately 300 feet, to the northeast corner of the site.

Wastewater Line – Wastewater from the site will be conveyed via an approximate 14-inch diameter, 1,500-foot sewer line proceeding northwest along North Golden State Boulevard, tying

into the existing 54-inch City of Fresno trunk line, just north of the intersection of North Golden State Boulevard and West Bullard Avenue.

a. Garfield Avenue (North of Bullard) – Existing (LOS N/A), Year 2025 Forecast (LOS C)

   West Bullard Avenue (East of Garfield) – Existing (LOS N/A), Year 2025 Forecast (LOS C)

   North Golden State Blvd (Herndon to Carnegie) - Existing (LOS A)

   North Golden State Blvd (Carnegie to Shaw) - Existing (LOS C)

   Herndon Avenue (SR-99 to Golden State) – Existing (LOS B)

   Weber Avenue (South of Herndon) - Existing (LOS N/A), Year 2025 Forecast (LOS N/A)

b. Precise location of the pipeline within the roadway and area required for the trenching operation will be determined after a detailed utility survey is conducted prior to construction. As discussed in Section 3.7.1.3, the width of the trench is dependent on the soil type encountered and requirements of governing agencies.

c. Traffic lanes closures will be minimized to the extent feasible and the project proponent and contractor will make every effort that no roadways will be totally shutdown to keep traffic flowing at all times. In there is an unavoidable need to close a roadway, it will be timed during nighttime or when traffic volume is low.

d. Lane closures could impact traffic flow by creating bottlenecks when traffic merges to the open lanes. This could be minimized by providing detours and alternate routes and timing of closure during night and off peak hours.

e. Short term impacts associated with roadway construction will be minimized by limiting work on multiple segments.

f. Pipeline construction and installation activities will be accelerated to minimize disruption to traffic. The length of pipeline construction activities within public rights of way are negotiated and stipulated during the encroachment permit process.

g. To minimize impacts to traffic and any homes or businesses that will be affected, all trenching operations will be either backfilled/restored or covered with steel plates during the end of a work. To the extent feasible driveways to homes and access to homes shall be operational at any given time with exception when work is directly in front of those properties.

TECHNICAL AREA: TRAFFIC AND TRANSPORTATION

Data Request 61 Rev:

a. Please identify and describe any school bus routes in the vicinity of the project.

b. If there are any school bus routes in the vicinity, please discuss how potential safety impacts for school children getting on or off busses or walking along the route would be eliminated.

c. Through discussion with the local school district, please identify student walking or bicycle routes in the project vicinity, potential safety impacts, and corresponding mitigation.

Response:

a. According to the Central Unified School District school bus route information, school buses use W. Herndon and W. Shaw Avenues.

b. There are no scheduled bus stops along the project vicinity.

c. Through discussion with the local school district Student Services Department Head, Mr. Joe Mandrin, 559.274.4700, it was explained that the district currently doesn't operate a Safe Routes to School Plan within the project vicinity. It is assumed that there are no students walking within the project vicinity.

TECHNICAL AREA: VISUAL RESOURCES

Data Request 62 Rev:

For the cooling tower, please summarize the conditions that affect vapor plume formation including cooling tower heat rejection, exhaust temperature, and exhaust mass flow rate. Please provide values to complete the table, and additional data as necessary for staff to be able to determine how the heat rejection load varies with ambient conditions and also determine at what ambient conditions cooling tower cells may be shut down.

Parameter	**Cooling Tower Exhausts**		
Number of Cells	3 cells		
Cell Height*	12.8 meters (42 feet)		
Cell Diameter*	6.71 meters (22 feet)		
Tower Housing Length*	27.7 meters (91 feet)		
Tower Housing Width*	11.3 meters (37 feet)		
Ambient Temperature*	16.8°F	63.3°F	114°F
Ambient Relative Humidity	95.2%	76%	14.4%
Number of Cells in Operation			
Heat Rejection (MW/hr)	45.2	58.2	63.9
Exhaust Temperature (°F)			
Exhaust Flow Rate (lb/hr)			

*Ambient conditions and heat rejection, neglecting water makeup and blowdown, are based on the three heat balance cases provided in Section 3 and Appendix A of the AFC. Cell diameter and height are from the air quality modeling CD. Tower length and width are from AFC Table 3.4-1.

Additional combinations of temperature and relative humidity or curves showing heat rejection vs. ambient condition, if provided by the applicant, will be used to more accurately represent the cooling tower exhaust conditions. Please include appropriate design safety margins for the heat rejection, exhaust flow rate and exhaust temperature in consideration that the air flow per heat rejection ratio is often used as a condition of certification design limit.

Response:

Parameter	**Cooling Tower Exhausts**		
Number of Cells	3 cells		
Cell Height*	12.8 meters (42 feet)		
Cell Diameter*	6.71 meters (22 feet)		
Tower Housing Length*	27.7 meters (91 feet)		
Tower Housing Width*	11.3 meters (37 feet)		
Ambient Temperature*	16.8°F	63.3°F	114°F
Ambient Relative Humidity	84.0%	62.0%	14.6%
Number of Cells in Operation	1	2	2
Heat Rejection (MW/hr)	46	58.6	63.3
Exhaust Temperature (°F)	82	91	103
Exhaust Flow Rate (lb/hr)	4,000,000	6,600,000	6,400,000

The cooling tower performance data is provided in the table above. Four (4) cells are expected to be in operation at ambient temperatures above 50ºF; three cells from 30ºF to 50ºF; and two cells for temperatures below 30ºF. The heat rejection can be defined as a function of ambient temperature in two regions: below 60ºF and 60ºF and higher. This is because evaporative coolers are used for CTG inlet air cooling at ambient temperatures 60ºF and higher. The expected heat rejection is given as follows:

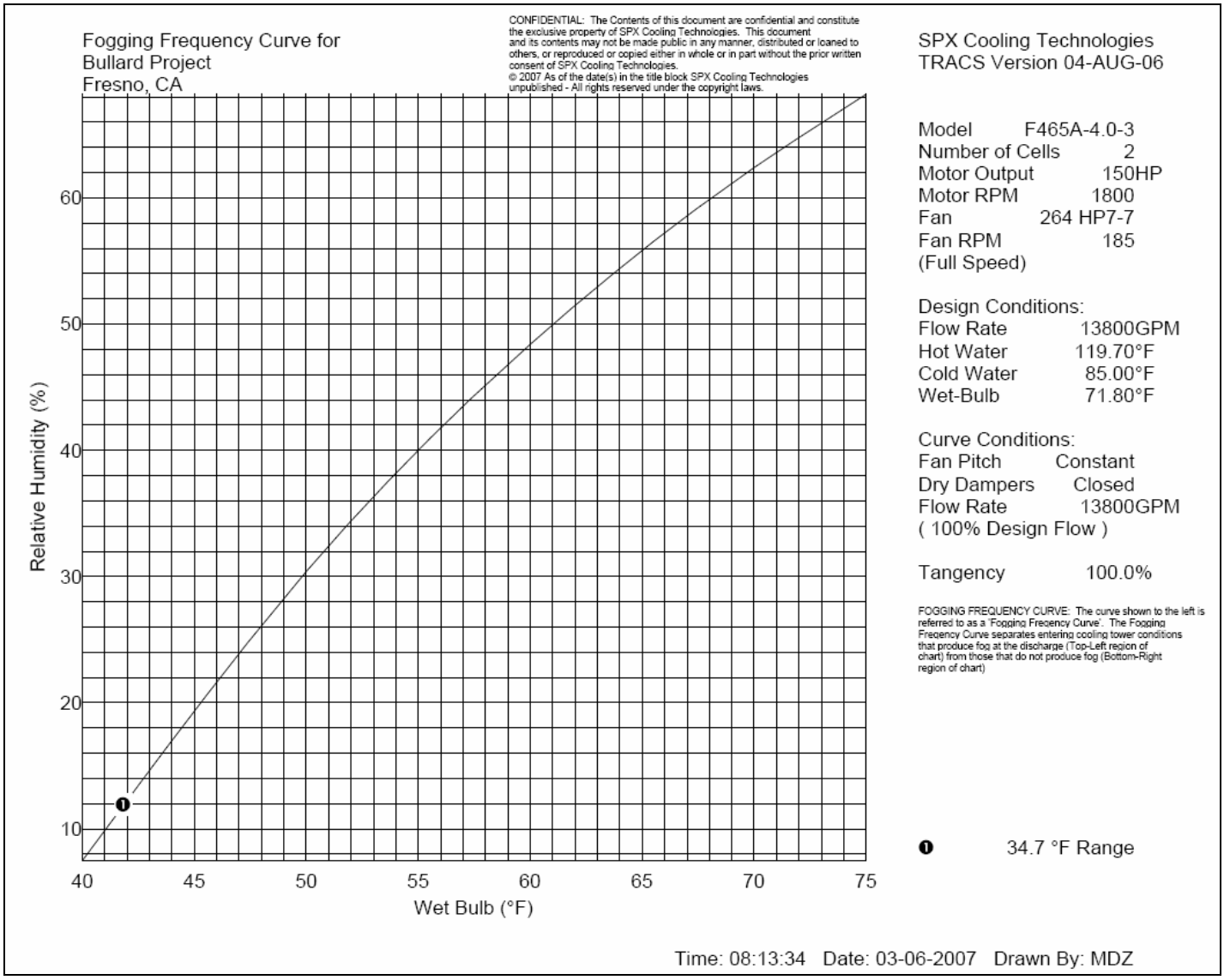
Below 60ºF - HR = 70.3 + 0.48*Tamb (MMBtu/hr for each CT in service)
60ºF and above - HR = 82.8 + 0.24*Tamb (MMBtu/hr for each CT in service)

TECHNICAL AREA: VISUAL RESOURCES

Data Request 63 Rev: Please provide the cooling tower manufacturer and model number information and a fogging frequency curve from the cooling tower vendor, if available.

Response:

The specific cooling tower for the project has not yet been selected. However, it will be a fiberglass, counter-flow, mechanical-draft cooling tower, such as a Marley Model F465A-4.0-3. A fogging frequency curve created by Marley for this tower model is provided below.



TECHNICAL AREA: VISUAL RESOURCES

Data Request 64 Rev: Please confirm that under normal full load operation of the two turbines only two of the three cooling tower cells will be operating, as noted in Table 3.11.4 of the AFC. Also, please indicate under what ambient conditions that additional cooling tower cells may be shut down while still operating under full load for both turbines.

Response:

Only two of the three cooling tower cells will be operating under normal full load operation of the two turbines. Refer to the data provided in the response to Data Request 62 for approximate information no ambient temperatures where a cell would be shut down.

TECHNICAL AREA: VISUAL RESOURCES

Data Request 65 Rev: Please confirm that the cooling tower fan motors will not have variable speed/flow controllers.

Response:

The cooling tower fan motors will not have variable speed/flow controllers.

TECHNICAL AREA: VISUAL RESOURCES

Data Request 66 Rev: Please indicate by quarter, or by day or day of week if desired, the hours of the day that the project would be expected to operate given the maximum quarterly operating schedule of 1,100 hours in each of the first and second quarters, 1,200 hours in the fourth quarter, and 1,600 hours in the third quarter (AFC page 5.2-36).

Response:

The units will be dispatched by PG&E based on an economic dispatch model. BEC is contractually obligated to be able to operate up to the stated number of hours per calendar quarter. Any detail beyond the quarterly hour limits cannot be provided.

TECHNICAL AREA: VISUAL RESOURCES

Data Request 67 Rev: Please indicate any other reasonable worst-case hourly operating profiles for this project that are supported by PG&E data on expected maximum future load demand for life of the facility. Please provide all supporting PG&E reference materials for any reduced maximum hourly operating profiles.

Response:

The units will be dispatched by PG&E based on an economic dispatch model. BEC is contractually obligated to be able to operate up to the stated number of hours per calendar quarter. Any detail beyond the quarterly hour limits cannot be provided.